

*Middlebury Railroad*

AMERICAN

# RAILROAD JOURNAL.

STEAM NAVIGATION, COMMERCE, MINING, MANUFACTURES.

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**HENRY V. POOR, *Editor.***

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CHARLES T. JAMES, *For Manufactures and the Mechanic Arts.*

M. BUTT HEWSON, *For Civil Engineering.*

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SATURDAY, JUNE 15, 1850.

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ESTABLISHED IN 1831.

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NEW-YORK:

PUBLISHED WEEKLY, BY

**JOHN H. SCHULTZ & CO.**

Room 12, Third Floor,

No. 136 Nassau Street.

## To the Proprietors of Rolling Mills and Iron Works.

**THE Undersigned**—Proprietors of Townsend's Furnace and Machine Shop, Albany—are extensively engaged in the manufacture of Machinery and fixtures for Iron, and Copper Rolling Mills, and Iron Works. Having paid particular attention to the manufacture of *Rolls* (Rollers), both *chilled* and *dry-sand*, they feel confident that they can execute orders for such castings in a satisfactory manner. And to give assurance of this, they beg leave to refer to the following named persons, proprietors and managers of some of the most extensive rolling mills in the country, viz: Jno. F. Winslow, J. Tuckerman, H. Burden, W. Burt, J. & J. Rogers, Saltus & Co., J. B. Bailey, L. G. B. Cannon, Hawkins & Atwater, etc., etc.

F. & T. TOWNSEND.

Albany, August 18, 1849.

## FARMERS! ATTENTION!!

**John Mayher & Co's**

NEW AGRICULTURAL WAREHOUSE  
AND SEED STORE.

197 WATER STREET, NEW YORK.

Where they have for Sale, the largest and most complete assortment of Farming Implements, ever offered for sale in this city—all of which they will sell 10 per cent. Cheaper than the same kind of Goods can be bought at any other house in the city. Our Goods are all Warranted to give satisfaction.

FARMERS wanting to purchase, will please call and examine our Stock before buying elsewhere.

Among our assortment may be found the Celebrated Highest Premium Eagle Ploughs! together with all the most approved Ploughs now in use.

Also,—Horse Powers, Threshing Machines, Fan Mills, Corn Shellers, Straw Cutters, Corn Mills, Seed Sowers, Churns, Ox Yokes, Ox Scrapers, Hay Rakes, Horse Rakes, Patent Chain Pump (that never freezes nor rusts), and other Pumps; in fact we have everything for Farming Purposes—together with Guano, Bone Dust and other Fertilizers.

JOHN MAYHER & CO.,  
197 Water st., N. Y.

February 9, 1850.

N.B.—J. M. & Co. also continue their Old Stand, at 195 Front street, near Fulton Market.

## Machinery Oil.

**WE** the undersigned are now manufacturing an oil intended for the use of Railroads, Steamers and Manufacturing establishments. It has been in use several months and has given very general satisfaction. Our price is uniformly 70 cts. per gallon. Enquiries or orders attended to promptly. Address

ROBBINS, LANGDON & CO.,  
133 Water street, corner Pine, New York.

## CERTIFICATES.

Providence, March 22d, 1850.

Messrs. Robbins, Langdon & Co.,  
Gentlemen: We have given your machine oil a thorough trial, and find that it possesses all the qualities that we could wish, as it works better than any sperm oil we have ever used. Our shafts that required oiling four times a day with the best sperm oil that we could get, work equally as well by the application of your oil twice a day, and your oil stands cold weather much better than any oil we have ever used. Our engineer having had years' experience in running and making engines, we put great confidence in his judgment, and he gives it as his opinion that your oil is fully equal to if not better than any he ever used; and we shall soon give you an order for more, as we do not want any other kind of oil as long as we can get yours.

Very respectfully yours,

JACKSON, CLARK & CO.

Bridgeport, Nov. 7th, 1849.

Messrs. Robbins, Langdon & Co.,  
Gentlemen: After about three months' trial of your oil, I have come to the conclusion to use it entirely on the engines on the New York and New Haven and the New Haven and Northampton Railroads for the following reasons:

1. It wears quite as long as sperm oil.
2. So far as I have tried it, it keeps the Journals equally cool as sperm oil.
3. I have no complaint from our men about cleaning the engines, and presume it is equally as easy to clean an engine by using your oil as it is in using sperm oil.
4. I can see no reason why it is not equal to the best of sperm oil for lubricating machinery.
5. There is in my opinion a very great saving to all parties in using your oil for lubricating machinery.
6. I believe it will stand cold weather better than any sperm oil. Very respectfully yours,

R. B. MASON, Supt. N.Y. & N.H. Railway.

Steamer Bay State, Oct. 22d, 1849.

Messrs. Robbins, Langdon & Co.,

Gentlemen: In answer to your request for my testimony as to the machinery oil manufactured by you, I will say that I have used it for some time past on the Bay State, and am perfectly satisfied that your statement to me of its good qualities, is correct. As far as its lasting properties go, it wears equally long as sperm oil, runs perfectly free, and has no appearance of thickening. As seeing is better than hearing, I would recommend you to send your friends on board our boat, and they can then, by ocular demonstration, judge for themselves. Yours respectfully, JOHN GRAY,  
Engineer of Steamer Bay State, Pier 3, N.R.

Steamboat Knickerbocker, Sept. 22, 1849.

Gentlemen: Mr. Hall, Agent of the Norwich and New London Steamboat Co., placed in my hands some of your machinery oil, which he desired me to use on the engine and other machinery, which I have done, and was so much pleased with the working, that I recommended the owners to give you their orders.

I have been using the article since August 19, and with perfect satisfaction, and I am well satisfied that your oil is as good as the best of sperm for lubricating machinery. I am yours very respectfully,

SAMUEL CARTER,

Engineer of Steamboat Knickerbocker, Pier 18, N.R.

To Messrs. Robbins, Langdon & Co.,

Oil Merchants, 133 Water street, New York.

Steamboat Worcester, N. York, Oct. 15, 1849.

Messrs. Robbins, Langdon & Co.,

Gentlemen: I beg to acknowledge the receipt of your letter requesting my opinion as to your oil for machinery, which I had not time to reply to previous to my return to Norwich. I have been using your oil on the engine and machinery of the Worcester with perfect success, and have much pleasure in testifying as to its good qualities. In my opinion, the journals keep cooler with your oil than with sperm, and it wears equally well. Should you at any time wish to refer to me as to your oil, I beg you will do so without hesitation. Yours respectfully, JAS. CROOKER.

Engineer Steamboat Worcester, Pier 18, N. R.

New York, August 3d, 1849.

Messrs. Robbins, Langdon & Co.,

Gentlemen: I received your letter in regard to your oil for machinery, which I handed to our engineer, and have much pleasure in sending you an extract from his letter to me on the subject: "I have applied the oil sent me upon our hot journals and cylinders, and find that they keep cooler with it than with sperm oil. I cannot find any fault with the oil, although I have watched it carefully. I have also tried it against an equal quantity of sperm oil, and find it wears quite as well." You are quite at liberty to show this extract to your friends, and shall be happy to give any further certificate you may require. WM. RIDER,  
Treasurer Union India-rubber Co., 19 Nassau st. N. Y.

New York, March 22d, 1850.

Messrs. Robbins, Langdon & Co.,

Gentlemen: I have been using your machinery oil on the engine and other machinery of the Steamer Southerner running from this to Charleston, and find it equal to sperm oil. I shall continue the use of the same, and you are at liberty to refer to me at any time. Yours respectfully, DAVID N. MAXON,  
Chief Engineer Steamer Southerner.

Steamboat C. Vanderbilt, N. York, Oct. 11, 1849.

Messrs. Robbins, Langdon & Co.,

Gentlemen: In reply to your inquiries respecting the qualities of your machinery oil, I am happy to inform you that I have been using the article sent me for some time past, not only on the engine but on all other machinery connected with it: and from a careful and close examination, I am well satisfied that your oil is as good as the best of sperm oil for lubricating machinery. I have recommended Mr. Lockwood the agent of the company, to give you their orders. Yours respectfully, JAMES BAKER,  
Engineer Steamboat C. Vanderbilt, Pier 3, N.R.

Brooklyn, August 29, 1849.

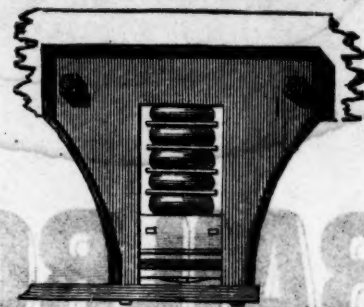
Messrs. Robbins, Langdon & Co.,

Gentlemen: Your letter of the 29th was received, and I am happy to inform you that I have used your machinery oil throughout my establishment, and I am still of the opinion that it is as good as the best of sperm oil for lubricating machinery. I should be pleased at any time to have your friends witness the working, and I am sure, after once doing so, will give you their orders. Please send me another cask by the evening of the 3d, and by so doing you will much oblige.

W. M. BURDON, Manufacturer of

Steam Engines and other Machinery, 102 Front st.

## FULLER'S PATENT INDIA RUBBER SPRING.



**THESE SPRINGS ARE THE CHEAPEST,** the lightest and most durable of any yet known. They are easily applied to new or old cars, and there is small possibility of any accident occurring to them.

Other parties through Mr. Ray set up claims to an India Rubber Spring which, though the same in principle, is very inferior in its working and durability. Actions are in progress for an Infringement on Fuller's Patent against parties using that Spring.

The superiority of Fuller's Spring over that claimed by Mr. Ray is fully established and has frequently been testified to. The following are from gentlemen who have had much experience with both Springs.

"It will afford me pleasure to recommend your springs to the companies in this region, in preference to Ray's which I am confident are inferior in mechanical arrangement to yours." JOHN M'RAE,  
Engineer S. Carolina R. R., Charleston.

"I do not hesitate to allow you to say that I concur in Mr. M' Rae's opinion that Ray's springs are inferior in mechanical arrangement to Fuller's. I repeatedly expressed that opinion long before Mr. M' Rae had seen your springs (as I believe) and entertain it still." WM. PARKER,  
Gen'l Supt. of Baltimore and Ohio R. R.

Office of Sup't Norwich & Worcester R.R. Co. }  
December 26, 1849. }

"I most fully concur in the opinion of Jno. McRae, Engineer of S. Carolina Railroad, that 'Rays Springs' are inferior to Fuller's Springs, and shall with pleasure recommend them to all Railroad Companies for adoption. I have used both springs on this road and have no hesitation in saying that I should in all cases prefer Fuller's Spring."

SAM'L H. P. LEE, JR.,  
Sup't and Engineer.

Office B. & P. R. R. Co., }  
Boston, 20th December, 1849. }

"This company have cars fitted up with both Ray's and Fuller's 'Metallic India Rubber Springs,' and I do not hesitate to say that Fuller's arrangement is very much superior to Ray's." W. RAYMOND LEE, Supt.

The following result has been obtained by experiment upon one railroad.

A set of Trucks fitted with Steel Springs cost	\$190-77	and weigh	2355 lb.
The same with Fuller's Springs,	131-71	"	1911 lbs.
Difference,	\$59-06	"	444 lbs.

Not only is there an advantage in the cost, but owing to the great reduction in weight, the car can be made lighter throughout, and so an enormous saving in weight may be effected in a Train.

## AGENTS.

G. M. KNEVITT, 38 Broadway, N. Y.,  
JOHN THORNLEY, 110 Chestnut St., Philad.  
The BOSTON BELTING CO., Milk st., Boston.  
January 2, 1850.

## American Cast Steel.

**THE ADIRONDAC STEEL MANUFACTURING CO.** is now producing, from American iron, at their works at Jersey City, N.J., Cast Steel of extraordinary quality, and is prepared to supply orders for the same at prices below that of the imported article of like quality. Consumers will find it to their interest to give this a trial. Orders for all sizes of hammered cast steel, directed as above, will meet with prompt attention.

May 28, 1849.



**IRON BRIDGES, BRIDGE & ROOF BOLTS,**  
etc. STARKS & PRUYN, of Albany, New York,  
having at great expense established a manufactory with  
every facility of Machinery for Manufacturing Iron  
Bridges, Bridge and Roof Bolts, together with all kinds  
of the larger sizes of Screw Bolts, Iron Railings, Steam  
Boilers, and every description of Wrought Iron Work,  
are prepared to furnish to order, on the shortest notice,  
any of the above branches, of the very best of Amer-  
ican Refined Iron, and at the lowest rates.

During the past year, S. & P. have furnished several  
Iron Bridges for the Erie Canal, Albany Basin, etc.,  
—and a large amount of Railroad Bridge Bolts, all of  
which have given the most perfect satisfaction.

They are permitted to refer to the following gentle-  
men:

Charles Cook,	Canal Commissioners
Nelson J. Beach,	of the
Jacob Hinds,	State of New York.
Willard Smith, Esq.,	Engineer of the Bridges for
Messrs. Stone & Harris,	the Albany Basin.
Mr. Wm. Howe,	Railroad Bridge Builders,
Mr. S. Whipple,	Springfield, Mass.
	Engineer & Bridge Builder,
	Utica, N. Y.

January 1, 1849.

**TO RAILROAD COMPANIES AND BUILD-  
ERS OF MARINE AND LOCOMOTIVE  
ENGINES AND BOILERS.**

**PASCAL IRON WORKS.**

**WELDED WROUGHT IRON TUBES**

From 4 inches to 48 in calibre and 2 to 12 feet long,  
capable of sustaining pressure from 400 to 2500 lbs.  
per square inch, with Stop Cocks, T, L, and  
other fixtures to suit, fitting together, with screw  
joints, suitable for STEAM, WATER, GAS, and for  
LOCOMOTIVE and other STEAM BOILER FLUES.



Manufactured and for sale by

**MORRIS, TASKER & MORRIS.**  
Warehouse S. E. Corner of Third & Walnut Streets,  
PHILADELPHIA.

**To Railroad Companies, etc.**



The undersigned has at last suc-  
ceeded in constructing and securing  
by letters patent, a Spring Pad-lock  
which is secure, and cannot be  
knocked open with a stick, like oth-  
er spring locks, and therefore particu-  
larly useful for locking Cars, and  
Switches, etc.

Companies that are in want of a  
good Pad-lock, can have open samples sent them that  
they may examine and judge for themselves, by send-  
ing their address to

C. LIEBRICH,  
46 South 8th St., Philadelphia.  
6m\*

**Mattewan Machine Works.**

THE Mattewan Company have added to their Ma-  
chine Works an extensive LOCOMOTIVE ENGINE  
department, and are prepared to execute orders for Lo-  
comotive Engines of every size and pattern—also Tenders,  
Wheels, Axles, and other railroad machinery, to  
which they ask the attention of those who wish such  
articles, before they purchase elsewhere.

**STATIONARY ENGINES, BOILERS, ETC.,**  
Of any required size or pattern, arranged for driving  
Cotton, Woollen, or other Mills, can be had on favora-  
ble terms, and at short notice.

**COTTON AND WOOLLEN MACHINERY,**  
Of every description, embodying all the modern im-  
provements, second in quality to none in this or any  
other country, made to order.

**MILL GEARING;**

Of every description, may be had at short notice, as  
this company has probably the most extensive assort-  
ment of patterns in this line, in any section of the  
country, and are constantly adding to them.

**TOOLS.**

Turning Lathes, Slabbing, Planing, Cutting and  
Drilling Machines, of the most approved patterns, to-  
gether with all other tools required in machine shops,  
may be had at the Mattewan Company's Shops, Fish-  
kill Landing, or at 66 Beaver street, New York.

WM. B. LEONARD, Agent.

**HEAD QUARTERS FOR RUBBER GOODS.**



**The Union India Rubber Company,**

MANUFACTURERS AND DEALERS IN EVERY VARIETY OF

**GOODYEAR'S PATENT METALLIC RUBBER FABRICS,**

Which they offer on the most liberal terms at their Warehouse,

**NO. 19 NASSAU STREET, NEW YORK.**

Articles which this Company has the exclusive right to make comprise in part

Beds,	Overcoats,	Life Preservers,	Mail Bags,	Camp Blankets,
Pillows,	Leggins,	Boat Floats,	Breast Pumps,	Travelling Bags,
Cushions,	Syringes,	Souwesters,	Saddle Bags,	Wading Boots,
Caps,	Canteens,	Gun Cases,	Clothing of all kinds,	Horse Covers,
Tents,	Buoys,	Portable Boats,	Carriage Cloth, assor.	Piano Forte Covers,
Bottles,	Maps,	Horse Fenders,	Hospital Sheetting,	Railroad Gum,
Tubs,	Sheet Gum,	Water Tanks,	Mattress Covers,	Hose, all kinds,
Caps,	Tarpaulins,	Army Goods,	Bathing Caps,	Shower Baths,
Pants,	Life Jackets,	Navy Goods,	Baptismal Pants,	Chest Expanders.

Together with all new applications of the Patent Rubber, which with Boots and Shoes, Packing, Machine  
Belting, Suspenders, Gloves and Mittens, Tobacco Wallets, Balls, Baby Jumpers, Elastic Bands, etc., etc.,  
will be sold to the Trade at Factory prices.

\*. All orders for special articles to be manufactured, should be accompanied with full descriptions and draw-  
ings.

October 20, 1849.

**RAILROAD**

**India-rubber Springs.**

If any Railroad Company or other party desires it,  
the New England Car Company will furnish  
India-rubber Car Springs made in the form of washers,  
with metallic plates interposed between the layers, or  
in any other form in which they can be made; in all  
cases guaranteeing the right to use the same against  
any and all other pretended rights or claims whatsoever.

F. M. Ray, 98 Broadway, New York.  
E. CRANE, 99 State Street, Boston.  
1849.

**Brown's Old Established  
SCALE WARE HOUSE,**  
NO. 234 WATER ST., NEW YORK.

THE Subscriber, Practical Manufacturer of Scales  
of every description, respectfully asks the atten-  
tion of Railroad Companies to his Improved Wrought  
Iron Railroad Track and Depot Scales which for  
strength, durability, accuracy, convenience in weigh-  
ing, and beauty of workmanship, are not surpassed by  
any others in this country.

He is aware that this is rather a bold assertion for  
him to make, yet he can say with confidence that they  
have but to be tried to give them precedence over all  
others.

J. L. BROWN.

Bank Scales made to order, and all Scales of  
his make Warranted in every particular.  
References given if required.

**THE NEWCASTLE MANUFACTURING Co.**  
continue to furnish at the Works, situated in the  
town of Newcastle, Del., Locomotive and other steam  
engines, Jack Screws, Wrought Iron Work and Brass  
and Iron Castings, of all kinds connected with Steam-  
boats, Railroads, etc.; Mill Gearing of every descrip-  
tion; Cast Wheels (chilled) of any pattern and size,  
with Axles fitted, also with wrought tires, Springs,  
Boxes and bolts for Cars; Driving and other wheels  
for Locomotives.

The works being on an extensive scale, all orders  
will be executed with promptness and despatch. Com-  
munications addressed to Mr. William H. Dobbs, Su-  
perintendent, will meet with immediate attention.

ANDREW C. GRAY,  
President of the Newcastle Manuf. Co.

**DEAN, PACKARD & MILLS,**

MANUFACTURERS OF ALL KINDS OF

**RAILROAD CARS,**

SUCH AS

PASSENGER, FREIGHT AND CRANK CARS,

— ALSO —

SNOW PLOUGHS AND ENGINE TENDERS

OF VARIOUS KINDS.

CAR WHEELS and AXLES fitted and furnished

at short notice; also, STEEL SPRINGS

of various kinds; and

**SHAFTING FOR FACTORIES.**

The above may be had at order at our Car Factory,

REUEL DEAN,  
ELIJAH PACKARD, } SPRINGFIELD, MASS.  
ISAAC MILLS, } 1y48

**Iron Safes.**

**FIRE** and Thief-proof Iron Safes, for Merchants,  
Banks and Jewelers use. The subscriber manu-  
factures and has constantly on



hand, a large assortment of Iron  
Safes, of the most approved con-  
struction, which he offers at much  
lower rates than any other manu-  
facturer. These Safes are made  
of the strongest materials, in the  
best manner, and warranted en-  
tirely fire proof and free from dampness. Western

merchants and the public generally are invited to call  
and examine them at the store of E. Corning & Co.,  
sole agents, John Townsend, Esq., or at the manuf-  
actory.

Each safe furnished with a thief-detector lock, of the  
best construction.

Other makers' Safes repaired, and new Keys and  
Locks furnished at the shortest notice.

H. W. COVERT  
cor. Steuben and Water sts. Albany  
August 24, 1848.



### NEW YORK IRON BRIDGE COMPANY.

The Bridges manufactured by this Company having been fully tested on different Railroads, by constant use for more than two years, and found to answer the full expectations of their most sanguine friends, are offered to the public with the utmost confidence as to their great utility over any other Bridge now known. The plan of this Bridge is to use the iron so as to obtain its greatest longitudinal strength, and at the same time it is so arranged as to secure the combined principles of the Arch, Suspension and Triangle, all under such controlling power as causes each to act in the most perfect and secure manner, and at the same time impart its greatest strength to the whole work.

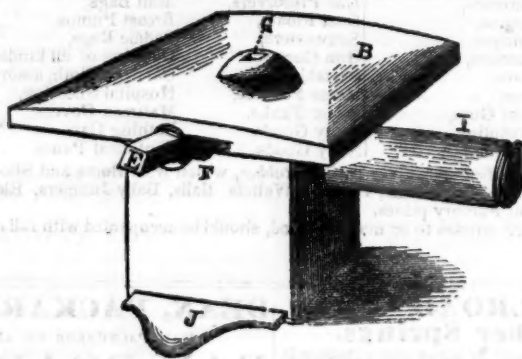
The NEW YORK IRON BRIDGE COMPANY are prepared to furnish large quantities of Iron Bridging for Railroad or other purposes, at short notice, and at moderate prices.

Models, and pamphlets giving full descriptions of the above Bridge, with certificates based on actual trial from undoubted sources, will be found at the office of the Company, 39 Jauncey Court, Wall st., or of W. RIDER & BROTHERS, 19 Nassau Street, where terms of contract will be made known, and where orders are solicited.

August 29, 1849.

M. M. WHITE,  
Agent for the Company.

### E. Harris' Patent Rotary Blacksmith Tuyere.



LETTERS Patent were issued January 9, 1849, to E. HARRIS, of Springfield, for an Improved Rotary Blacksmith Tuyere. Since that time there have been some hundreds put in operation, giving satisfaction and full proof of superiority over all others.

This Tuyere is so arranged that by one movement it can be changed from the largest work to the smallest; at the same time the fire is changed in proportion, thereby making a great saving in coal. Words cannot convey the full merits of this Tuyere; nor is it deemed necessary to speak in disparagement of other Tuyeres, as every smith is capable of judging for himself, and will give merit where merit is due.

I will simply say that there has not been a single instance where I have had my Tuyere put in use but it has given full satisfaction, and is recommended by all who have used them, as being superior to any other ever introduced. I would invite all to give them a trial; and the names of those using them being given, I hope it may induce others to try; they recommend themselves.

Western Railroad Shop,	Springfield, Mass.
Connecticut val.	Pittsfield, "
"	Springfield, "
"	N. Hampton, "
Hartford	Hartford, Conn.
New Haven	New Haven, "
Norwich and Worcester,	Norwich, "
N. York and N. Haven,	New Haven, "
Saratoga and Whitehall,	Saratoga, N. Y.
Vermont Central,	"
Hudson and Berkshire,	Hudson, "
L. Kingsley,	Canton, Mass.

Hadley Falls Co. Ireland,	W. Springfield, Mass.
Sidney Patch,	Boston, "
Ames Manuf. Cor.,	Chickopee, "
American Machine w'ks,	Springfield, "
Dean, Packard & Mills	"
G. Frank Bradley,	N. Haven, Conn.
Andrew Baird,	"
Collis & Lawrence	"
Slate & Brown,	Windsor Locks,
Gage,	Nashua, N. H.
Machine shop,	Manchester, "
Louis F. Lanney,	Baltimore, Md.
J. H. Baerddid,	179 Chambers st. N. Y.
J. Fanning	Rochester, "
G. W. Hunt	41 Gold st. "
Chamberlain & Waldo,	"
P. S. Burges, carriage maker,	"
Samuel Miller,	"
J. Leggett,	Steverson falls, "
J. E. Harris,	Hillsdale, "
John L. Graham,	Albany, "
David Daisell,	South Egremont, Mass.
Roys & Wilcock,	Berlin, Conn.

Agents for the sale of Tuyeres:  
B. B. Stevens in New York and Connecticut.  
A. J. VanAllen has the Agency for the Western and Southern States, and is now travelling through those States. Any communication addressed to the patentee will receive prompt attention.

E. HARRIS, Patentee,  
Springfield, Mass.

November 23, 1849.

### Railroad Lanterns.

COPPER and Iron Lanterns for Railroad Engines, fitted with heavy silver plated Parabolic Reflectors of the most approved construction, and Solar Argand Lamps; manufactured by

HENRY N. HOOPER & CO.,  
No. 24 Commercial St. Boston.

August, 16, 1849.

6m33

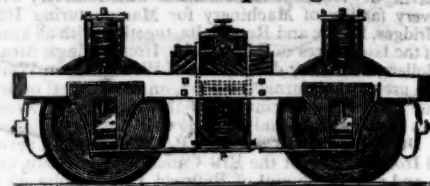
### Gas Fixtures.

FIXTURES for Burning Gas for Lighting Public Buildings, Private Dwellings, Stores and Factories, manufactured by the subscriber in great variety. Orders by Mail, or left at the Factory on Causeway street, will be promptly attended to.

HENRY N. HOOPER & CO.

Boston, March 23, 1850. 6m13

### F. M. Ray's Patent India-rubber Car Springs.



India-rubber Springs for Railroad Cars were first introduced into use, about two years since, by the inventor. The New England Car Company, now possesses the exclusive right to use, and apply them for this purpose in the United States. It is the only concern that has tested their value by actual experiment, and in all arguments in favor of them, drawn from experience of their use, are in those cases where they have been furnished by this company. It has furnished every spring in use upon the Boston and Worcester road, and, in fact, it has furnished all the springs ever used in this country, with one or two exceptions, where they have been furnished in violation of the rights of this company; and those using them have been legally proceeded against for their use, as will invariably be done in every case of such violation.

The Spring formed by alternate layers of India-rubber discs and metal plates, which Mr. Fuller claims to be his invention, was invented by Mr. Ray in 1844.—In proof of which we give the deposition of Osgood Bradley, of the firm of Bradley & Rice, of Worcester, Mass., car manufacturers, and men of the highest respectability. In this deposition, in relation to the right of parties to use these springs, he says:

"I have known Mr. Ray since 1835. In the last of May or the commencement of June, 1844, he was at my establishment, making draft of car trucks. He staid there until about the first of July, and left and went to New York. Was gone some 8 or 10 days, and returned to Worcester. He then on his return said he had a spring that would put iron and steel springs into the shade. Said he would show it to me in a day or two. He showed it to me some two or three days afterwards. It was a block of wood with a hole in it. In the hole he had three pieces of India-rubber, with iron washers between them, such as are used under the nuts of cars. Those were put on to a spindle running through them, which worked in the hole. The model now exhibited is similar to the one shown him by Ray. After the model had been put into a vice, witness said that he might as well make a spring of putty. Ray then said that he meant to use a different kind of rubber, and referred to the use of Goodyear's Metallic Rubber, and that a good spring would grow out of it." There are many other depositions to the same effect.

The history of the invention of these springs, together with these depositions, proving the priority of the invention of Mr. Ray, will be furnished to all interested at their office in New York.

This company is not confined to any particular form in the manufacture of their springs. They have applied them in various ways, and they warrant all they sell.

The above cut represents precisely the manner in which the springs were applied to the cars on the Boston and Worcester road, of which Mr. Hale, President of this road speaks, and to which Mr. Knevit refers in his advertisement. Mr. Hale immediately corrected his mistake in the article quoted by Mr. Knevit, as will be seen by the following from his paper of June 8, 1848. He says:

INDIA-RUBBER SPRINGS FOR RAILROAD CARS.—"In our paper yesterday, we called attention to what promises to be a very useful invention, consisting of the application of a manufacture of India-rubber to the construction of springs for railroad cars. Our object was to aid in making known to the public, what appeared to us the valuable properties of the invention, as they had been exhibited on trial, on one of the passenger cars of the Boston and Worcester railroad. As to the origin of the invention we had no particular knowledge, but we had been informed that it was the same which had been introduced in England, and which had been subsequently patented in this country; and, we were led to suppose that the manufacturers who have so successfully applied this material, in the case to which we referred had become possessed of the right to use that patent. It will be seen from the following communication, addressed to us by a member of the company, by which the Worcester railroad was supplied with the article upon which our remarks were based, that we were in an error, and that the springs here introduced are an American invention, as well as an American manufacture. How far the English invention may differ from it we have had no opportunity of judging."



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### American Railroad Journal.

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Saturday, June 15, 1850.

### An Essay on Pen and Pocket Cutlery,

*Embracing a Detailed Description of the Mechanical, Chemical, and Manual Operations Performed on Certain Raw Materials, to Convert them into the Means, Implements, and Materials, for Manufacturing Pen and Pocket Knives.*

BY A. L. HOLLEY.

CHAPTER III.—BLADES DESCRIBED AND CLASSIFIED. FORGER'S IMPLEMENTS AND APPARATUS. COKE, ITS NATURE AND MANUFACTURE. MARKING, HARDENING AND TEMPERING—DIFFERENT METHODS. TABLES OF COLORS, BATHS, TEMPERATURES, ETC. IMPROVEMENTS. FUEL. BITUMINOUS COAL. CHARCOAL.

Continued from page 354.

Pen and pocket blades are hardened by heating several at once till the color is a bright cherry red, and then plunging them into cold water up to the tang. They are then placed, point upwards, in boxes of steel scales, the tang being wholly buried

therein, that it may gradually cool and be partially annealed. The blades, now hard and brittle, must be slightly softened again, in order to give them a quality intermediate between brittleness and ductility, which shall ensure them proper strength.—They are first rubbed on one face with a fragment of grindstone, burned that it may cut the faster, in order to brighten them, that the temper may be visible as it runs down the blade, and then set up in a row containing some dozens on a steel plate called the tempering plate from 12 to 15 inches long and 6 wide, over a slow fire. Those nearest the twyre heat first, and as fast as they arrive at the proper temperature they are removed by small tongs, and if still heating plunged into cold water, and if tight laid aside. The temper for pen blades is 470° F., which is in all cases decided by the eye of the forger, by the color, which is a full yellow. For pocket blades, the temperature is 509° or 510°, and the color a brown dappled with purple spots. The following is a table of colors which steel exhibits at different temperatures, which vary from 430° when a change of appearance is first perceived, to 360° when they are again quite soft.

Color.	Temperature.
1. Very pale straw yellow.....	430°
2. Shade darker of yellow.....	450°
3. Darker straw yellow.....	470°
4. Still darker yellow.....	490°
5. Browner yellow.....	500°
6. Yellow with purple tinge.....	520°
7. Light purple.....	530°
8. Dark purple.....	550°
9. Deep blue.....	570°
10. Paler blue.....	590°
11. Still paler blue.....	610°
12. Pale blue and tinge of green.....	630°

The colors which steel exhibits at these different temperatures, are caused by the action of the oxygen in the atmosphere on the heated metal. Various other methods of tempering blades of different sorts have been devised, one of which is by heating them over a moderate fire in vessels containing oil or tallow. The appearance and color of the smoke indicates the degree of heat, which if just visible corresponds with the straw color, and if black with the darker colors. Thus the heat may be easily and equally employed. A more correct knowledge of the degree of heat is obtained by immersing a thermometer into a vessel of oil or tallow, and by its aid keeping it at exactly the required temperature. Oil boils at about 600°, and of course in it pen and pocket blades may be temper-

ed. Another excellent method is by placing the steel on the surface of mercury, or of melted fusible alloy, in which is plunged a thermometer graduated to 600° or more, as an index of the heat; as thus hundreds of blades may be tempered at the same time precisely alike. The following is a table of metallic baths, etc., made by Mr. Parkes, a distinguished chemist:

### Edge Tools to be Tempered in Various Baths.

	Parts.	Temper.	
	lead.	tin.	ature.
Lancets—in a bath composed of...	7	4	420°
Other surgical instruments.....	7½	4	430
Razors, etc .....	8	4	442
Penknives, and some implements of surgery .....	8½	4	450
Larger penknives, scalpels, etc.....	10	4	470
Sissors, shears, garden hoes, cold chisels, etc.....	14	4	490
Axes, firmer chisels, plane irons, and pocket knives: .....	19	4	509
Table knives, large shears, etc.....	30	4	530
Swords, watch springs, etc.....	48	4	550
Large springs, daggers, augers, fine saws, etc.....	50	2	558
Pit saws, hand saws, and some kinds of springs.....(Boiling linseed oil.			600
Articles which require to be still soft- er.....(Melted lead.			612

An excellent way of hardening very large implements and blades, is by cooling them in a case of fusible alloy of 8 parts lead, 2 tin and 5 bismuth, in cold water. The case is fused by hot water, leaving the steel free from cracks. A good workman can forge from 18 to 20 dozen pen blades daily, and from 2 to 7 dozen of the largest kinds of pocket blades. The forger's trade is perhaps the most important of all branches in knife making, as the *beau ideal* of pocket knife excellence and beauty, at least, is considered a blade which will cut paper, pens, pine, walnut, nails, pins, etc., and never dull, break, or bend; the handle being a minor point. Some such knives are actually in existence. Forgers in this country are very scarce at present, but Americans are fast becoming masters of this difficult trade. Machinery will not probably be successfully applied to this branch, as the operations are so quickly performed, and must be manual in order to produce good blades, for numerous experiments have proved that the steel of blades, unlike most other substances, will not admit of being "hurried up" into shape by a few jams and strokes from a complicated Yankee contrivance, and retain its virtues and good qualities. "Swaged" are inferior

to forged blades, and the perfect and complex machinery necessary (even if any could be made to answer every purpose) to wield the hammer in different directions, to graduate the strokes, and to heat, hold and turn the bar, cannot as yet be employed as cheap as good forgers. Among the American improvements, the most important is machinery for cutting pocket blades from sheet cast steel, by dies and punches, in order to form with less labor, and very perfectly, the tanges which need not the temper of the cutting part, and which are imperfect and not alike when forged, and need much filing. The whole is left by the press of equal thickness, with a short blunt point, and the faces and swages being forged as those of other blades by the process termed smithing, moothing and tanging being omitted, they possess all the virtues which hammering adds to forged blades. If blades are "fired" and then swaged they are inferior, also those made by a "drop," or other machinery. The process of tanging is omitted in making some forged pocket blades, the tang being cut by a fly press and dies and punches, which cause it to fit without filing. Till some alloy or other metal is used for blade making, the greater share of the labor of this branch must be manipulation, though great improvements can undoubtedly be made in hardening, tempering, tanging, etc.

Fuel is one of the most expensive ingredients in the cost of blades, as well as of other implements, but we have reason to believe that the new mode of decomposing water and burning its oxygen and hydrogen will be perfected, and by its aid heat, the great spirit which impels our machinery, and renders our minerals, metals, and other resources available for use, will cost comparatively a mere trifle. Bituminous coal, now the best fuel known for blade making, indispensable in other branches of manufactures, and the main support of British production at least, "is found in beds or strata in that group of secondary rocks which includes the red sandstone and mountain limestone formations which is commonly called the carboniferous group or coal measures." From the peculiarities of the deposits, the name of coal fields or coal basins is often applied to them. The majority of geological authorities seem unanimous on several points respecting the origin of coal, which are of great theoretical importance. 1st. It is evidently formed from extensive forests, and of exclusively vegetable origin. From this we may infer that the vast quantities of wood which are constantly drifted into the present ocean by some of our large rivers, are now undergoing a similar formation. 2d. From the nature of the vegetables preserved, the climate of the parts where coal exists was both tropical and ultratropical. 3d. The coal strata were undoubtedly deposited in the vicinity, or perhaps on the edges, of extensive fields of dry land; for in regard to position, the trees found in coal beds are often similar to submarine forests. Lastly. The coal strata were singularly elevated and broken by forces probably of volcanic origin. Many coal fields are apparently of mechanical formation, and consist of irregular stratified coal, sandstone, etc. It is obvious from the manner in which the carburized hydrogen escapes in "blowers" from the stata, where it is greatly condensed and perhaps a liquid, that these depositions, and the transformation of timber into coal, have often been effected under immense pressure, either with or without heat. It is supposed by Messrs. De Lue, Adolphe, Brougnart, De la Beche and others, that coal measures are extensive tracts of vegetable matter, resembling

peat bogs, alternating with sand, etc., which submerged and covered them. They are of equal thickness usually for a great distance, but sometimes irregular, and are seldom worked when less than two feet thick. The nature of the upper stratum or roof is of the greatest importance, which if not strong and compact leaks, and must be artificially supported at great expense. We may observe design in the accumulation of vegetable matter many centuries since, to supply our present wants, and the contorted, dislocated, upturned, twisted and broken strata of coal regions, though interrupting the miner's progress, and in the eyes of superficial observers, frustrating design, are in reality of greater utility than they could be if regular, for the expense incurred in keeping the pits of an unbroken and continuous strata free from water would consume the profits, and cause the coal mining business to be abandoned. The mines of Northumberland and Durham are the deepest in England, being worked more than a thousand feet below the earth's surface. The strata of coal is usually from six to nine feet deep, but one at least in Staffordshire, England, exceeds forty feet in depth.

Charcoal, the fuel so extensively used for preparing materials for knife making, and various other purposes, is a form of carbon obtained by burning wood with the slight access of air, and for fuel is prepared in large kilns, or in pits of conical form; in the latter by piling together pieces of wood, covering them with earth, and burning them slowly for a week or more. A few small openings are left near the bottom, through which the pile is fired, and in the upper part to allow the smoke to escape, and the coal is allowed to cool before the turf is removed. The fragments of wood at the side partially charred are called brands, and are excellent fuel. Cylinder charcoal, one of the ingredients of powder, is made by distilling wood free from resin, as willow, beach, and logwood, in iron cylinders, so constructed as to collect the volatile products, among which are tar and pyroligneous acid. Charcoal is a bad conductor of heat, is not injured by air or moisture, hence posts and stakes are often superficially charred, and is infusible, as without air it undergoes no change in the most intense heat. It absorbs air and moisture, also the odoriferous parts of animal and vegetable substances, and animal vegetable charcoal in particular, will purify tainted water and meats. Carbon is the "pure combustible base" of diamonds, charcoal, and other carbonaceous substances.

#### Conway and Menai Tubular Bridges.

Professor Cowper has delivered a lecture on this interesting subject at the Royal Institution. The Professor commenced by briefly distinguishing between the real tubular structure of Stephenson and certain foreign bridges from which, as has been alleged, that principle was taken. Thus, the wooden bridge at Schaffhausen, which was destroyed by the French in 1790, and which was supposed to have suggested the tubular form, is proved by a model now in the museum of King's College to have been simply an arched bridge, having a roof as a shelter from rain. The same remark is equally applicable to a bridge at Wittengen and to wooden bridges in America, where the roadways are roofed. The Professor then read a brief notice of various proposals and estimates, by which it appeared that the attention of the legislature had been directed to the urgent necessity of a safe transit over the Straits of Menai since the year 1783. The most elaborate report was furnished by the late Mr. Rennie, who compiled several designs and estimates for bridges, either of cast iron, or partly of cast iron and partly of stone. Prof. Cowper then proceeded to explain and to illustrate by models the principle of a bridge. He showed that the force

exerted on the arch bridge is that of *compression* only—in the suspension bridge the force exerted is that of *extension* only; and that in the bow-and-string bridge, both extension and compression are exerted. It was shown that the same forces are also exerted on the girder, viz: extension on the under and compression on the upper side. This was demonstrated by the following experiment:—wood, tin plate and tin tubes, were successively inserted in a space of about four inches, purposely cut for that purpose in the middle of a girder, where it was also joined. When the tin plate was inserted in the upper side, it bent under the pressure of a few pounds; but when rolled up into a tube it supported more than one hundred pounds. Again, when the same piece of tin plate was fixed to the under side of the girder, where the force of extension was called into action, it would have required several hundred weights to have torn it asunder. Mr. E. Hodgkinson's experiments on the best form of section for cast iron girders were then adverted to. Small experimental girders, devised by that gentleman, were shown. They resemble the letter T. It was stated that the strength of this girder, when the flat side was uppermost, was to its strength when inverted,  $\frac{1}{2}$  as 1 to  $\frac{3}{4}$ . Other forms of section showed that the distribution of the same quantity of material would give differences in strength varying as 5 $\frac{1}{2}$ , 11, 15, 19.

It was then explained how wrought iron tubes had been employed by Locke, Brunel, Fox and Henderson, in the bow of bow-and-string bridges, and by Fairbairn in girders. The insufficiency of ordinary suspension bridges to support railway trains was adverted to; and Prof. Cowper explained a perfectly novel and highly scientific design of a railway suspension bridge, the invention of his son, E. A. Cowper. This bridge, from the principle of its construction, is called "the inverted arch bridge." An arch of an ordinary cast iron bridge, like the Southwark bridge, is secure in whatever position the load is placed, because the lines of thrust are contained within the arch of plates. Now, imagine a similar arch of wrought iron plates to be inverted, and a roadway hung to it, then, wherever the load may be placed, the lines of strain will also be contained within the inverted arch of plates, and consequently there will be no deflection of the road. This very original invention is worthy the attention of engineers. Professor Cowper then explained Mr. Stephenson's original proposal to build, without interrupting the navigation by scaffolding, a bridge of two cast iron arches, the centre pier being placed on the Britannia rock. It was shown by a model how two half arches could be built on the opposite sides of a pier—each being tied to, and so balancing, the corresponding voussoir on the other side. Other conditions imposed by the Admiralty, but incompatible with the plan of the railway, induced Mr. Stephenson to adopt the plan of a vast tube. A section, made of rope, comprising the full size of the tube, was suspended from the ceiling of the theatre of the institution; it was 15 feet wide and 30 feet high, and Prof. Cowper stated the length to be 460 feet—above twice the height of the monument. After many experiments on cylindrical, elliptical, and other forms, Mr. Fairbairn adopted that of a rectangular tube, with rectangular cells at the top.—Prof. Cowper illustrated, by experiment, the necessity of stiffness at the top of the tubes, and demonstrated that this was obtained by the cellular form. The Menai tube is made with wrought iron plates varying from  $\frac{1}{4}$  to  $\frac{1}{2}$  of an inch in thickness, firmly rivetted together with T iron at the joints. The rectangular cells at the upper side are eight in number, and are one foot nine inches square, and there are six similar rectangular cells at the bottom of the tube. The method of putting the tube together, and of raising it by hydraulic presses, was explained and exhibited by a model. The bridge consists of two lines of tubes, extending over two centre spans of 460 feet each. These tubes, when in their places, were joined together by intermediate tubes of about 50 feet over the piers; thus, not only making the length of one entire tube to am't to 1524 feet, but, by the junction, adding considerably to the strength. The weight of the tubes is about 10570 tons. The Conway tubular bridge has been in use for some time, and it is found that an ordinary train deflects the tube about one eighth of



an inch: that hot sunshine causes the heated side to bow out about one inch: that the strongest wind deflects the tube about one inch. It is intended to put sliding stays between the up train and down train tubes of the Britannia bridge, so that they will support each other against the wind. The difference of temperature between summer and winter will expand the entire Britannia bridge about 12 inches; this is provided for by fixing the middle of the tube on the Britannia pier, and allowing the ends to rest on 48 rollers, about six inches diameter in the abutments, the rails in those parts being allowed to slide by each other. On the table were the works of Fairbairn and Dempsey; some plates of the tubular bridge by E. Clark, Esq., the resident engineer; and two models of the Conway and Britannia bridges.—*English paper.*

#### Qualities and Admixtures of Iron.

In the evidence before the Strength of Iron Commission, it was stated by Mr. Glynn, that the use of the hot blast in the manufacture of iron does not of itself make iron worse or better; but by its means, materials, otherwise intractable, yielding alloys of iron, may be smelted, instead of ores yielding purer metal. Mr. Morris Stirling has not found any distinct difference between the chemical constituents of hot blast and cold blast iron, but apparently there is more carbon in the hot blast iron, and graphite is more commonly to be seen on the surface of No. 1 hot blast than on cold blast iron. Mr. Charles May considers that, by the use of the hot blast, the quantity of carbon which can be combined with the iron is increased. Mr. Hawkshaw and Mr. Fairbairn consider hot blast iron weaker than cold blast; the latter gentleman and Mr. Stephenson state that the use of the hot blast renders the metal very fluid; and Mr. Glynn says that its use is to produce in large quantities, and at a cheap rate, a soft fluid metal, to be employed in light castings, and that in that respect he considers the invention to be of great public benefit, as enabling Scotch iron masters to use a new kind of ore, which, though of a weaker character, further experience may enable them to purify and improve. At the same time the hot blast is essential for smelting the ironstone from South Wales with anthracite coal, and the metal yielded is of the strongest character. Mr. Glynn and Mr. Stephenson mention that generally hot blast iron is dark grey in color, and very fine in the crystal; but it appears to be universally agreed that there is no certain method of distinguishing hot blast from cold blast iron. Mr. Rastrick states that the temperature of the hot blast at the Gartsherrie furnaces was 680° Fahrenheit.

Mr. Stephenson does not attach much importance to the variation in strength of different sorts of iron, but considers that, taking the average of irons generally throughout the country, there is a proximity to a uniform standard. He concluded, from a series of experiments made by him for the High Level bridge at Newcastle, that hot blast iron is more certain in its results than cold blast; that mixtures of cold blast are more uniform than those of hot blast; that mixtures of hot and cold blast give the best results; that simple samples do not run so solid as mixtures; that simple samples sometimes run too hard, and sometimes too soft for practical purposes. Mr. Rastrick would prefer making girders of forge iron. Mr. Hawkshaw would use the Low moor iron. It is however generally admitted that mixing irons from different parts of the country produces the best castings, and since the object in mixing them is to obtain the proportion of carbon to iron which gives the greatest strength combined with the required degree of fluidity, the exact proportion will be regulated by the appearance of the fracture of the several irons. Mr. M. Stirling states that No. 1 hot blast iron, mixed with No. 3 cold blast, will give the right proportion of carbon; but that if iron containing that proportion could be obtained at once from the blast furnace, it would be very superior. Mr. Charles May however observes, that the strength of cast iron depends upon the bulk into which it is to be run as well as upon its constituent parts, and that the art of the iron founder, consists in his ability to produce the required amount of strength without any very definite knowledge upon the subject, either chemical or mechanical. Mr. Fox considers a very good

mixture for girders to be cold blast Blaenavon, two thirds, and of hot blast Scotch two sorts, from the black band and the red hematite ores, one third. Mr. Grissell considers the use of old scrap iron to be of immense value, and would use Scotch iron, cold blast Welsh and old scrap. Mr. Fairbairn names as the best mixture, independently of price, Lowmoor, No. 3, 30 per ct.; Blaina, or Yorkshire, No. 2, 25; Shropshire, or Derbyshire, No. 3, 25; good old scrap, 20—equal 100 per cent.

Mr. Glynn names one third strong iron from S. Wales and two thirds of the more fluid metal of Yorkshire, Derbyshire and Shropshire. Mr. C. Fox, Mr. Grissell and Mr. May, however, all concur in stating that mixtures of iron practically depend very much upon the commercial question of cost, and it is generally admitted that engineers have no guarantee that the mixture for which they may have stipulated in a contract shall be that used by the founder; hence Mr. Fox recommends that engineers in contracting for a number of girders should stipulate that they should not break with less than a certain weight (leaving the mixture to the founder) and cause one more than the required number to be cast; the engineer might then select any one to be broken, and if it broke with a less weight than had been agreed upon, the whole should be rejected. Mr. Glynn considers that the strongest castings are those cast in the air furnace in dry sand, and that castings in loam are stronger than those in open sand. The metal is more dense and more free from impurity when cast upright.—Mr. Fox and Mr. Fairbairn also prefer the air furnace. With respect to wrought iron, Mr. Stirling considers the processes adapted in its manufacture as capable of great improvement. Mr. E. Clark states, that wrought iron from the same maker is not always the same, and though there is not much difference in the ultimate strength of iron, that some qualities extend much more than others before breaking.—*Mining Journal.*

#### Change of Internal Structure in Iron.

In the evidence given before the Strength of Iron Commission, Mr. Rastrick mentions that at the Pontypool Iron Works a bar of wrought iron suspended and continually struck by a hammer at the bottom, dropped in two after a length of time, but he knows of no instance of a change of structure on railways. Mr. Hawkshaw, though he has observed crystallization in broken rails and axles, has not traced it directly to vibration; he thinks mill-gearing and shafts would furnish good examples, though when they break, the various circumstances under which the fractures have taken place should be observed. Mr. Grissell has observed that the vibration to which crane chains are exposed changes the iron from very beautiful malleable iron to the crystalline appearance of cast iron.—He does not consider that cast iron is subject to the alteration of structure. Mr. Fox considers that vibration does produce a change in the internal structure of wrought iron, and instances that if the thread of a screw be cut in a wrought iron bar, and that the bar be broken across the tapped part the fracture there will be found more crystalline than at the other part; he mentions the frequency with which shafts and mill gearing break, and states that cold hammering the axles to give them a high polish changes their internal structure; but instead of remedying the injury by annealing, he recommends that they should be finished at a high temperature. Mr. Grissell mentions that chains of cranes often break with a crystalline fracture, which he attributes to a change in the internal structure, but he does not consider the same effect is produced in cast iron. Mr. Fairbairn states, that repeatedly making a wrought iron bar red hot, and plunging it into cold water, renders it crystalline, and that the fibrous texture may be restored by annealing; he considers that percussion renders the fibres more liable to break off short, but that, without it is sufficient to cause a considerable increase of temperature, it does not produce any real internal change. Mr. Glynn considers that the structure, both of wrought and cast iron, is altered by a succession of blows, the wrought to a crystalline structure, the cast to larger crystals; he has observed this appearance particularly in axles, mill shafts, toothed wheels, crow bars, and crane chains; the latter, even when especially made of strong fibrous

iron, require to be annealed after about three years; the axles of tenders to which breaks have been applied he mentions as particularly subject to this change. He attributes the alteration to galvanic action, induced by the alloys from which iron is never entirely free, and considers that the action is increased by blows. He also mentions that brass wire, of copper and zinc, originally tough and fibrous, continually breaks off short with a crystalline fracture, radiating in the form of a star, showing a change in the structure such as would have taken place if the metal had been melted and had crystallized in cooling; this effect is more rapidly produced in an atmosphere containing sulphuric acid. Mr. W. H. Barlow mentions having caused a piece of fibrous iron to be hammered for a long time by a blacksmith, and that he found the iron changed from a fibrous to a crystalline structure; but as axles do not undergo the same sort of hammering, he does not know whether the same effect takes place in them. Mr. Stephenson considers the fact of an alteration of structure as highly improbable, and cites the connecting rod of an engine having vibrated 25,000,000 times, and yet being perfectly fibrous. In the cases of axles the iron may not have been fibrous in the first instance, for though when a piece of iron is rolled from 1 foot in length to 20 feet it necessarily becomes fibrous, it does not necessarily become so when rolled from 1 foot in length to 6 feet. He says that in all cases of change of structure which he has heard of there has always been some important link wanting.—Mr. Locke considers that concussion would alter the structure of iron, but would not offer an opinion as to whether the fracture of axles arose from that cause; he mentions that a great many axles broke when the crank axles were in use, but that since straight axles have been adopted fewer breakages have occurred. Mr. I. K. Brunel doubts the change of internal structure, and thinks the various appearances of different fractures result as much from the mode in which the iron has been broken as in any change in structure, and that change of temperature will also produce a variation in the fracture; that iron in a cold state shows a more crystalline fracture than the same iron warmed a little, and that wrought iron does not actually become crystalline and fibrous, but breaks either fibrous or crystalline according to the combination of circumstances under which it is broken, but with the combination required he is not acquainted; he cites the stratification and planes of cleavage of rocks, which may be broken with different fractures according to the mode of applying the blow. Mr. Brunel exhibited various specimens broken, some with a fibrous fracture by means of a slow heavy blow, and some with a crystalline fracture, by means of a sharp short blow. Mr. Charles May cites the beam of a steam engine as an instance of continued vibration not affecting iron, and mentions as an instance in favor of the change in iron from percussion the fact that a gun used in his works to break pig iron across, at last dropped in two as if it had been cut.—*Min. Jour.*

#### Analyses of Cast Iron.

Mr. F. C. Wrightson, of Birmingham, has communicated to the Chemical Gazette an interesting paper on this subject, of which the following is an abstract:—The effect of phosphorus, in producing what is termed cold short iron, has long been admitted; but that the use of hot blast occasioned an increase of phosphorus, the author thinks never has been suspected—at all events, never announced. To elucidate this point, and also of furnishing more complete analyses of cast iron than had yet been done, Mr. Wrightson undertook a series of experiments, thus described:—“The specimens were easily broken to small pieces in a steel mortar. In one portion of from 20 to 30 grs., the sulphur and phosphorus were determined. In a second quantity all the other constituents were determined, except the carbon. On being treated with HCl and warmed, the iron is quickly acted on, and in a few hours dissolved, leaving black flakes and particles floating in the liquid. These were collected on a filter, previously dried at 212°, and weighed. After well washing, until no trace of HCl remained, the filter was again dried and weighed. The increase was carbon principally, with small quantities of silicates of oxide of iron, lime, &c., and in the num-



bers VII and VIII, iron is an equivalent proportion to the carbon. In these latter, as also in the numbers I. and III., the silica, iron, &c., of the substance separated by the filter were determined by fusing it with nitrate of potash mixed with twice its weight of carbonate of soda; the iron, &c., separated in the usual manner, gave the carbon by loss. This was afterwards verified in two instances by a direct determination of the carbon in a combustion tube. The iron, &c., separated in the above manner, was added to that obtained from the solution. The carbon was designated *b*, and being deducted from the entire quantity found in the iron by the method to be detailed, gave the quantity of carbon designated *a* for the reason before named.—The filtered liquid and washings, evaporated to dryness and again treated with acid and water, usually left a minute portion of silica, which was separated, weighed, and added to the former quantity. A current of sulphuretted hydrogen being passed through a small quantity of the solution, it in no case gave any other than a milk white precipitate of sulphur. After being carefully freed from this, and from SE, it was returned to the main solution, NO<sup>5</sup> added, and boiled until all the iron was peroxidised, and ammonia added gradually, until the solution only faintly reddened litmus, and nearly all the iron was precipitated. A little neutral benzoate of ammonia separated the last portions of the peroxide of iron. The precipitate, after well washing, was dried, ignited, weighed, and examined for manganese by fusion with nitrate and carbonate of potash; for chrome and alumina by dissolving in HCl, and precipitating with caustic potash in excess; only minute traces of alumina were occasionally found in the potash. But the peroxide had, in one or two instances, to be re-dissolved, and the manganese separated afresh. This occurred when ammonia had been added to the solution in excess, and a few drops of HCl added, which were not sufficient to neutralise or acidify the whole of the solution, which, from being very bulky, required care in neutralising. When the entire solution, after attaining the requisite degree of acidity, was transferred from one vessel to another, so as to obtain a uniform mixture; then no trace of manganese was found with the iron. From the amount of peroxide the percentage of iron was calculated. Before proceeding to separate the manganese, the solution and washings were evaporated to dryness, and the salts of ammonia driven off by ignition to redness. This, I had found, from repeated trials, was absolutely necessary, in order to separate the whole of the manganese by hydro-sulphate of ammonia. After ignition, the residue was always of a brown color from the peroxide of manganese; a drop or two of HCl dissolved this. Ammonia and hydro-sulphate of ammonia were then added, and the solution allowed to stand for several hours, and gently warmed. The sulphuret of manganese thus separated was converted into sulphate of manganese, from which the per centage of manganese was calculated. In one or two cases, where small quantities of nickel and cobalt were present, these were left as sulphurets on the filter, when the sulphuret of manganese was dissolved by dilute sulphuric acid. The solution, after getting rid of the excess of hydro-sulphate of ammonia, was neutralised, and oxalate of ammonia added.—The lime thus separated was converted into carbonate; and from it the proportion of calcium deduced. A drop or two of the solution, with phosphate of soda, occasionally indicated very minute traces of magnesia; these were overlooked. After separating the lime, the solution was evaporated to dryness, ignited in a platinum capsule, and the residue, consisting of the alkaline chlorides, weighed; a few drops of solution of bi-chloride of platinum being added to the moistened salts, the potash was separated (when sufficient in quantity to weigh) in the usual manner; the weight of the chloride of potassium calculated, and deducted from the weight of the mixed chlorides; the loss gave the weight of the chloride of sodium. Further delicate experiments were resorted to, for the purpose of determining the quantity of sulphur, phosphorus, carbon, and nitrogen; the traces of ammonia were so minute, as to render it questionable whether they might not have been obtained from the atmosphere of the laboratory. From eight of a numerous variety of experiments on the iron ores of

South Staffordshire, he found the difference in the per centage of phosphorus in hot and cold blast iron to be as follows:—

	1.	2.	3.	4.	5.	6.	7.	8.
Cold blast.	0.47	0.41	0.31	0.20	0.21	0.36	0.03	0.36
Hot blast.	0.51	0.55	0.50	0.71	0.54	—	0.07	0.40

The specimens of iron ore were from the Level Iron Works, near Dudley, belonging to Lord Ward, to whose agent, Mr. R. Smith, he expresses his grateful acknowledgments for the trouble and expense incurred in forwarding the investigations, and observes that, if the ironmasters as a body exhibited the same degree of interest in the improvement of their manufacture, there would be such changes introduced as would prove of great national benefit; but at present *quantity* is the object, *quality* altogether beside the question.—*London Min. Jour.*

#### The English Iron Trade.

The results of the proceedings of the preliminary meeting at Birmingham, reported in the Journal of the 30th March, were typical of what has transpired at the general meetings of Wolverhampton and Birmingham, on Wednesday and Thursday last. The conference was marked by decided flatness, and although prices were nominally maintained, it appears, since the preliminary meeting, they have been modified, to meet the peculiar circumstances of individual firms. Too much importance must never be attached to the decisions of these quarterly meetings, further than as superficial indications of the condition of trade; for, although the larger firms, through whose influence the prices are fixed, may generally abide by the terms agreed on, it is a well-known fact that they are constantly being undersold by needy manufacturers, who are forced to sell, and are too often happy to make sales at greatly reduced prices. Nor are these the only parties who swerve from the engagements entered into—holders of large stocks are often, in spite of resolutions at quarterly meetings, glad to make sales at a lower figure, or disguise the transactions under the shape of a discount. It was publicly stated in Wolverhampton that, although present prices are not sufficiently remunerative, the leading firms are prepared, in the way of discount, should circumstances arise to render such proceeding necessary, to make those reductions in price which the extent of sales, or state of the iron market, may require. This, certainly not satisfactory state of affairs may be attributed to various causes; the great excitement which prevailed four or five years since has subsided, and that excitement, the result of railway speculation, which intoxicated the proprietors of iron works, has led to a fearful collapse. There is little doing. Speculative men who engaged in railways—some of the most influential iron-masters of the district—have been seriously injured by embarking in local undertakings, more especially in the Oxford, Worcester, and Wolverhampton lines; and, as may be easily conceived, few people possess spirit, much less money, to embark in any trade except that in which the return is not only certain, but immediately profitable. Many orders given some time since have been suspended, and the present state of our commercial negotiations with the United States, particularly in relation to the exportation of iron from this country, promises greatly to aggravate existing evils. It is feared by many largely interested in the iron manufacture of this neighborhood, that the efforts of Sir Henry Bulwer, at Washington, to obtain a modification of the American tariff, with respect more especially to the importation of iron, will prove abortive for some time to come. Our exports of iron from South Staffordshire are said to be already considerably reduced, and should our transatlantic friends continue, as they threaten, their restrictive commercial policy, business in these important manufacturing districts must of necessity be still more limited than it is at the present moment. The wages of the workmen are extremely low; not more than two-thirds of the works are employed; and last week upwards of 2,900 were relieved by the Wolverhampton Poor-law Union.—The iron trade of South Staffordshire is unquestionably at the present moment, like that of South Wales, entirely speculative. Prices, although declared by quarterly meetings, are altogether arbitrary, and must be considered as regarded by cir-

cumstances. They are quoted to-day as follows: Bars, £6; rods, £6 to £6 10s.; hoops, £6 10s.; sheets, £7 10s.; pigs, £3 to £3 5s. These are the nominal prices of the present quarterly meetings, so far as they have been held, although purchases could be made below these prices; but little certainly can, however, be felt, until the concluding meeting at Dudley, on Saturday night. At the Birmingham meeting, on Thursday, the tone of the market was gloomy; however, all the usual bills and acceptances were satisfactorily settled. There is a general feeling, too, that on the opening of the Stour Valley line of railway a much greater development of the mineral produce of the district will take place for the supply of the metropolis, and that the supply of Staffordshire coal, in particular to London, will become a great trade. Among all these matters, information under the stringent Act of Lord Hatherton, against the "tommy" system, have been laid by wholesale—70 convictions have taken place in the Walsall district alone, and in other parts of the iron and coal fields of Staffordshire, prosecutions are still going on. Although there is little doubt that the profit on the goods sold is the main object, the excuse often is that the master cannot carry on his works and pay in cash; and in some instances the stoppage of the system has led to the closing of iron works, which accounts for the number of unemployed receiving parochial relief. The system is, however, fraught with evil; the party practising it commits a fraud on the fair manufacturer, who pays in money, and also on the retailer, who deals in the necessities of life and the sooner it is abolished the better.—*London Mining Journal.*

The New York Courier publishes the following correct table of the distances between Boston and Liverpool, and between New York and Liverpool:

Distance from New York to Liverpool.	
From Battery, New York to Sandy Hook	17 miles
From Sandy Hook to lat. 40 40 N. long.	
69 W. course N. 84, 45 E. true	229
From lat. 40, 40 N. long. 69 W. to lat.	
51, 12 N. lon. 9.39 W. course N. 75.39	
E. true	2550
Cape Clear would then bear N. true 14	
miles distant.	
From position off Cape Clear to Coburg	
dock, Liverpool	288
Total	3084
Distance from Boston to Liverpool, via Halifax.	
From dock in Boston to Boston light bearing N. N. W. true 4 distant	9 miles
From position off Boston light, lat. 43,	
19 N. lon. 65.21 W. course N. 76.29	
E. true	252
Borrocoa Point, Nova Scotia, would	
then bear N. W. true 10 miles distant.	
From position off Borrocoa point to Sombro	
Island light, bearing W. true 2	
miles distant N., 50.37 E.	107
From position off Sombro light to Halifax	12
Distance from Boston to Halifax	380 miles
From Halifax to Sombro light bearing	
W. true 4 miles distant	12 miles
From thence to lat. 46.30 N. long. 53.04	
W. course N. 75.00 E. true	453
Cape Race would then bear N. 9 1/2 miles	
distant.	
From position off Cape Race to lat. 51,	
12 N. long. 9.29 W. course N. 64.23	
E. true, great circle sailing	1716
Cape Clear would then bear N. true 14	
miles distant.	
From off Cape Clear to dock in Liverpool	288
Total distance	2849 miles
Recapitulation.	
From New York to Liverpool direct	3082 miles
To Liverpool via Halifax	2849
Differ in favor of Boston	235 miles



**Ship Building in New York.**

We see daily many interesting items of news in the columns of the New York *Sun*—among which we find the following on ship building in that paper of Tuesday, which we transfer to our columns.

At the yard of Wm. H. Webb are two fine crafts under way. The first is to replace the Caleb Grimshaw, that was recently destroyed by fire. She is 180 feet long, 40 feet beam, and 22½ feet depth of hold; and has been contracted for by Messrs. Thompson, Nephew & Co. She will be launched about the middle of August, and is to be commanded by Capt. Hoxie, formerly of the Grimshaw. The other is a steamship for Messrs. Spofford, Tilleson & Comp'y., intended to take the place of the *Northerner*, which was long since placed in the California trade. She will be named the 'Union,' and commanded by Captain Budd. The length of her deck is 212 feet, 34 feet beam, depth of hold 22 feet, and will be launched about the 1st of September.

Messrs. Smith & Dimon are now building an elegant packet ship for Messrs. Goodhue & Co., of the following dimensions: 152 feet in length, 33 ft. beam, and 18 feet in depth. She is nearly completed and will be launched in a few days.

The enterprising builders, Messrs. Westervelt & Mackey, have two extensive ship yards, one at the foot of Third street, East River, and the other between Seventh and Eighth streets, where there are three handsome steamers and two packet ships rapidly approaching completion. At the former yard, is a large steamer, building for the Havre trade, to run in connection with the *Franklin*, the dimensions of which are 283 feet in length, 40 feet beam, 27 feet depth, and about 2700 tons burthen. This vessel will be launched in the latter part of August.

Another steamship, intended for the California trade, has been contracted for by Messrs. Davis, Brooks & Co. She is to be 220 feet long, both deck and keel, 36 feet beam, 22 feet deep, and 1600 tons burthen, and will be ready for her machinery by the last of September.

At the same yard is a beautifully modelled packet ship building for Messrs. E. W. Hurlbut, who intend to place her in the trade between New York and Havre. She is 165 feet on deck, 36 feet beam, 27 feet deep, and about 1100 tons burthen, and will be launched about the 18th of August next. Capt. Doane is to be her commander.

At the branch yard of Westervelt & Mackey, foot of Third street, is a ship of 173 feet in length, 37½ feet beam, 22½ feet in depth, and 1150 tons burthen, now building for her owners, Messrs. Boyd & Hincken, who will place her in the Havre line of packets as soon as she is completed. She will be commanded by Captain Willard, formerly of the *Oneida*, that was lost some time since.

Charles Morgan, Esq., proprietor of the Morgan Iron Works, has contracted with Westervelt & Mackey to build him a steamboat for the Southern trade, which has been commenced, with a keel 193 feet long, 23 feet beam, 18 feet depth, and 1200 tons burthen. She will not be ready to launch until the close of the summer.

Messrs. Platt & Son, of Philadelphia, have contracted with Jacob Bell, to build a large ship for the Canton trade, which will be ready to receive her rigging about the 12th of July. She is 190 feet long, 36 feet wide, 21 feet deep, and of about 1200 tons burthen. Capt. Lockwood is to take command of her.

The keel (220 feet long) for a mammoth ship

was laid by Jacob Bell, and when finished will be used as a Liverpool trader. As yet it is not known in whose line she is to be placed.

Wm. H. Brown, Esq., the Messrs. Colliers of this city, and Perrin, Patterson & Stack of Williamsburgh, are all busily engaged in completing several large vessels, a description of which will be given in the "Sun" in a few days.

**Chemical Constituents of Iron.**

In his evidence before the Strength of Iron Commission, Mr. Morris Stirling states, that iron in its pure state is malleable, and that it is a combination of carbon with iron which produces cast-iron. In addition to carbon, the cast iron in this country contains silica, lime, magnesia, alumina, occasionally some of the phosphates and other admixtures; but iron made from magnetic ores is much purer. The strength of cast iron depends upon its freedom from impurities, and upon the proportion of carbon it contains. The strongest cast iron contains about three per cent. of carbon, or according to Mr. Charles May, when the carbon is in the smallest proportion that produces fluidity; a larger proportion tends to make the iron soft and weak, and a smaller hard and brittle. Mr. Glynn states, that the strongest iron generally shows a clear grey, or slightly mottled fracture, and he considers that the color indicates the combination of carbon with iron which produces the greatest strength. Mr. Stirling states, that while color is admissible as a test of strength, it is not so of chemical constitution, for though dark colored iron is usually weak, grey iron usually strong, and white iron usually brittle, yet black iron when chilled becomes white, although it must be supposed to contain the same quantity of carbon; hence, as a general rule, he concludes that color indicates the treatment to which iron has been subjected, and in some cases only the quantity of carbon. Mr. May coincides in considering the question of strength to be very much reducible to the quantity of carbon contained in the iron, as some of the tenderest iron skillfully treated will produce some of the strongest castings. Messrs. Stephenson and Stirling mention that the fluidity of the Berlin iron is due to the presence of arsenic, and the latter has observed that manganese mixed artificially with cast iron closes the grain, and is an improvement both to cast iron and steel. On wrought iron the effect of manganese is stated to be to give it the hot-short property, while cold short is produced by the presence of a small quantity of phosphorous; and the admixture of arsenic renders wrought iron hard and brittle.—*Mining Journal*.

**News from the Copper Region.**

The propeller *Napoleon* returned on the 23d, being the first vessel down this spring. She went up as far as the Ontonagon river, and made a quick and pleasant trip. We gather the following particulars from passengers, who are directly from the mines. The working companies are everywhere meeting with success; commencing with the western mines at Ontonagon, the Minnesota company, during the winter, have extended three shafts to the depth of 85 feet, connecting them by a level, at that depth 300 feet in length. They have completed an adit for drainage, 350 feet in length, which will drain their mine to the depth of 85 feet.

In these openings, by partial stopping, they have raised for shipment about 65 tons mass copper, together with the usual quantity of barrel and stamp work. A stamping mill is being erected which will enable the company, with their extensive mining operations, to ship three or four hundred tons of copper this season.

At the Forest mine a new work was commenced last fall and great progress has been made in opening it during the winter—it promises well and has the same show of native copper as the other mines in this vicinity. Mr. Hodge, editor of the mining department of the *American Railroad and Mining Journal*, went up on the first boat to take charge of this mine, and is making preparations to work a large force of men during the summer.

The Adventure company have been working but a small force, the mine promises well in native copper. Now that the Pittsburgh and Boston com-

pany have bought half of this mine, it is expected that the working will be greatly enlarged.

The Aztec and Ridge mining companies have been doing considerable, principally in the way of exploring, and have met with success, beyond their expectations in the discovery of rich veins; and they are making preparations to work extensively this season.

The Douglass Houghton company's veins are being worked under the direction of C. C. Douglass, Esq., and are now in a most promising condition. They have taken out considerable stamp work and some large masses of copper, and from appearances it will soon rank with the best mine on the lake. Shipments of copper will be made from this location during the season.

The Algonquin mining company are proposing to renew operations this spring on a large scale, under the superintendence of J. R. Grout, Esq., and from the richness of their veins they will undoubtedly meet with success. This interesting section of the lake country, so recently explored and made known, is fast rivaling Keewenaw Point in its richness in native copper and in population. The farming interests of this region are beginning to receive more attention, and from the fertility of the soil and the inducements for furnishing supplies to the mining companies, will undoubtedly rapidly increase.

Passing to Keewenaw Point, the North American mine has been doing well—they have raised considerable copper during the winter and will make large shipments during the season.

The Cliff mine is worked with the usual success and will, no doubt, produce the usual quantity, a thousand tons or more, of copper this season. The Northwest mine has been extensively opened during the winter, and fifty or sixty tons of copper have been raised, and is improving in appearance as the mine is opened. The Northwestern company are preparing to renew operations. They have veins of undoubted richness and well situated for being worked to advantage.

There are also several new companies making arrangements for commencing operations on the Point. Several tracts of mineral land have been entered at the Land Office, both on the Ontonagon and the Point, and the greatest confidence is felt by every body in the country at the success of the working companies. New interests are springing up, and new explorations going on this spring that shows increased confidence in the copper and iron mining business of Lake Superior. And it is a matter of congratulation that this valuable section of mineral country, so remote from the settled portions of the United States, and in which a heavy expense attends the development of its mineral wealth, is about to realize the anticipations of the most sanguine in its favor.

We hope to have it in our power to give in our next an account of the progress of the iron mines at Carp river, and now that we shall be able to get almost weekly intelligence from every portion of the mineral country, we shall endeavor to procure, as often as possible, particular accounts of the working and progress of each mine.—*Lake Superior Jour.*

**Improvement of the London Sewage.**

Among the numerous plans for improving the sewage of London, and at the same time preserving the Thames from pollution, which were sent in to the Commissioners of Sewers a few weeks since, is an ingenious one from Baron Von Rathen, for raising the manure into elevated tanks by the force of compressed air. He proposes to form a certain number of central, or main sewers, along certain principal thoroughfares, to lifting stations in the various suburbs. The sewage water is here admitted into sump of large dimensions, connected with which is the lifting apparatus; it consists of two air-tight iron tanks, beside the sump, having each a valve or lock, which, opening and shutting, admit the sewage liquid alternately into each. Through the top of each tank a pipe descends nearly to the bottom, the other end of which is carried over the heads of cisterns placed at any elevation, and bent down through an opening in their tops.—From a compressed air reservoir connecting pipes are carried to the air-tight chambers, the valves of which also work alternately, but in contrary direc-

tions to those opening into the sump; the consequence is, that as soon as a sufficient quantity has flowed into one air-tight tank, and its valve closed, the compressed air valve immediately opens, and the liquid is forced up through the pipe before mentioned, and flows into the cisterns, from whence descends one pipe to conduct it away to manure any district, and another for filling close tanks on wheels, to be carried where it might be required. Of course the most economical way at present known of compressing air for such a purpose would be by steam power; but the baron states that he has a new power engine, without fire, a description of which we should be happy to be favored with.—*Min Jour.*

#### Chesapeake and Ohio Canal.

The Cumberland Civilian of Friday says: "On Monday next it is understood the water will be let into the canal for the distance of some seven or eight miles, the length of the first level, commencing at this place—with the view of trying the bank. In a short time the experiment will be continued further down the line until the water communication becomes continuous to dam No. 6. This is, indeed, an earnest of speedy completion. We have also been informed since the above was written, that on Saturday the water will be let in on the levels near locks 69, 70, 71, in the neighborhood of Oldtown."

The water has been let off the lower part of the canal, for the purpose of repairs, which will probably occupy some five or six weeks. When it is again opened we hope that the trade will extend as far as Cumberland.

The Civilian also says that, in anticipation of the completion of the canal, there is an unusual activity among the mining companies of the Cumberland coal fields. All the companies are preparing to do a large business, and many which heretofore have had but limited facilities for transportation to market, are making extensive arrangements for the operating of the regular coal trade.

#### New York.

##### Syracuse and Binghamton Railroad.

The above project has recently been renewed under auspices that give every promise of success. Nothing has been wanting, but that those interested in it should be fully aroused to its importance. They have abundant means for its construction, and these means they now intend to make available to the work.

A large meeting in aid of the road was held in Syracuse on the 4th inst., at which was submitted the report of the committee consisting of Harvey Baldwin, John Wilkinson, Hiram Putnam, Townsend Ross, and Nathan Randal, Esqs., appointed at a previous meeting to prepare tables of the cost, business and income of the road, etc. From this report it appears that the road will be about 7 miles long, running through the counties of Onondaga, Cortlandt, and Broome, one of the finest portions of the State. The whole cost is estimated at \$1,400,000, or \$20,000 per mile.

This road when completed will be as the committee state in their report form one of the links in the great chain of railroad communication running from the north to the south bounds of the United States—terminating on the north at Oswego, and on the south at Mobile—and passing through a country rich in mineral and agricultural wealth, and through innumerable villages, and some of the principal cities of the Union. With this constructed, there would remain but about 40 miles to connect us with the railroads of Pennsylvania—thus giving us a direct route across the country to Philadelphia, Baltimore and Washington, and at the

same time bringing us in connection with the North branch canal and other canals in the State of Pennsylvania.

The committee estimate the business of the road as follows:

Freight on 100,000 tons of coal for the salt works and domestic use, and the Lake trade at \$1 per ton.....	\$100,000
Add for return freight, salt, gypsum, lime, hydraulic cement, lumber, flour from the Oswego mills and other places, grain, neat stock and other produce 38,000 tons equal to.....	\$75,000

Making, on these articles alone.....	\$175,000
Add to these for merchandise to be shipped from New York, Philadelphia, Baltimore, and other places including cast, pig, and bar iron and nails, from the mines of Pennsylvania, 25,000 tons, equal to.....	\$25,000

And it gives the gross sum of.....\$200,000

Transportation of through and way passengers, and the transportation of the mail, and which are estimated as follows, viz:

Through passengers, 200 per day, at 2c. per mile.....	\$37,640
Way passengers, 100 per day, at \$1 each.....	31,300
Transportation of the mail at \$150 per mile.....	10,500
Making, of probable rates, a grand total of.....	\$279,440

The expense of running the road, including ordinary repairs per annum, 3 daily trains each way, is estimated at.....\$107,482

This being deducted, leaves a net balance of.....\$172,958 or about 12 per cent. for annual dividends.

These estimates are based upon the present wants of the country without taking into calculation the great increase from the increased facilities and rapid growth of country, and it will be seen that from these sources alone the road would make rich returns to its stockholders.

The route will be very nearly level. This, together with the importance of its connections, and the rich and populous country through which it will run cannot fail to make it a paying road, in our estimation. It will form an important tributary to that great work, which is now in condition to extend to this new project if required.

With the two great lines of railroad traversing the State from east to west, and the numerous cross roads, which, at very short distances, will be constructed from one to the other, the people of New York will be well supplied with every convenience for locomotion.

**Auburn and Rochester Railroad—Election of Officers—The Consolidation, &c.**—At a meeting of the stockholders of the Auburn and Rochester railroad company, held yesterday, June 3d, at Canandaigua, the following persons were elected directors of said company—

Henry B. Gibson, Charles Seymour, Oliver Phelps, Jacob Gould, E. Darwin Smith, Joseph Fellows, William V. J. Mercer, William F. Weld, Nathl. Thayer, Robert H. Ives, William A. Sackett, John H. Chedell, Horace White.

Henry B. Gibson was unanimously re-elected President; Jacob Gould, Vice President; Charles Seymour, re-elected Secretary and Treasurer; and Asa Sprague, Superintendent.

The board of directors, we understand, approved and adopted the plan of consolidation with the Auburn and Syracuse company, recommended by the committee of the two corporations at their meeting in Boston, and resolved to insist on the consolidation on the 1st of August, and to concur in no delay beyond that period. They also deputed a committee to confer with the straight line company,

and procure the transfer of its rights, etc., consisting of Henry B. Gibson, John Wilkinson, Nathaniel Thayer, William F. Weld, R. H. Ives, and E. Darwin Smith, so as to be prepared to complete such transfer within the four months allowed by the act for the consolidation of said companies.—*Advertiser.*

**Syracuse and Utica Railroad Company.**—At an annual election held in Syracuse, the following gentlemen were elected directors for the year ensuing, viz:

John Wilkinson, Charles Stebbins, Oliver Teall, David Wager, Hamilton White, Samuel French, John Stryker, Joel Rathbun, Holmes Hutchinson, Ira Hawley, James Hooker, Elias W. Leavenworth and James Watson Williams.

John Wilkinson, Esq., was unanimously re-elected President of the said company for the ensuing year; and Hon. Charles Stebbins, was in like manner elected Vice President.

At the annual meeting of the stockholders of the Attica and Buffalo railroad company, held June 3d, 1850, the following gentlemen were chosen directors for the ensuing year:—William Sturges, Samuel Dana, Cyrus C. Dennis, Daniel W. Tomlinson, Harvey Putnam, Dean Richmond, Gains B. Rich, Horace White, Aaron Rumsey, Henry Martin, Stephen King, Charles H. Lee, Francis H. Tows.

At a subsequent meeting of the directors, Henry Martin was chosen President, and Dean Richmond Vice President.

**Troy and Boston Railroad.**—The ground was broken yesterday by the citizens of Troy, for a railroad between that city and Boston via Fitchburgh. The Mayor of Troy, the Common Council, several military companies, Mr. Briggs, Mr. Hadley, Gen. Wool and others participated in the ceremony. This is a laudable enterprise, and we commend the public spirit, intelligence, and liberality which suggests and carries forward such works.—*Albany Evening Jour.*

The Buffalo Republican says: "We understand that the directors of the Buffalo and Attica, Tonawanda, Auburn and Rochester, and Syracuse and Utica railroads have passed resolutions authorising a committee appointed by each road to immediately subscribe 5 per cent. on their capital stock to the Buffalo and State Line road. This amount, in connection with the subscriptions of individuals, makes an available capital of over \$500,000—sufficient to insure the immediate completion of the road to the State line. It is expected that the Albany and Schenectady, and Schenectady and Utica roads will also subscribe five per cent. on their capital stock. A meeting of the different committees will be held in this city in a few days to complete the subscription."

The receipts on the New Haven railroad for May show a continuance of the favorable condition of the traffic of that road. The increase, it will be seen, is large, and as yet nothing but a passenger business has been done:

**Receipts of New Haven Road for May, 1850.**

Passengers.....	\$42,841 15
Commutation, Freight, etc.....	3,689 11
Total.....	\$46,530 26
Deduct paid other lines.....	5,898 85
	\$40,631 41
Same month in '49.....	23,968 25
Increase (equal to nearly 75 p. ct).....	\$16,664 16



**Ogdensburg Railroad.**—The annual meeting of the stockholders of this road was held in Champlain, on the 26th ult. The following gentlemen were elected directors:—T. P. Chandler, Robert G. Shaw, Benjamin T. Reed and J. W. Edmonds, of Boston; Isaac Spaulding of Nashua, N. H.; Chas. Paine of Northfield, Vt.; J. L. Russel, Canton, N. Y.; Hiram Horton, Malone, N. Y.; George Reddington, Waddington, N. Y.; George V. Hoyle, Champlain, N. Y.; James H. Titus, New York city; G. N. Seymour and Henry Van Rensselaer, Ogdensburg. T. P. Chandler was re-elected President; William T. Eustis, of Boston, Treasurer; and James G. Hopkins, Clerk. Colonel Charles L. Schlatter remains Chief Engineer and Superintendent. The whole line (117 miles) is expected to be ready for business operation on the 1st of October next.—*Burlington Free Press.*

#### New York and Erie Road.

The great sale of the 3d class bonds of this road took place on the 12th instant in this city. They were disposed of at rates ranging slightly above 90 cents on the dollar. The largest bidders were Messrs Ward & Co., for \$2,500,000; John Thompson, for \$550,000; Wm. & J. O'Brien, for \$450,000; and Dykers & Alstyne, for \$250,000. The other bids ranged from \$5,000 to \$200,000. The bid of Ward & Co. was \$1,250,000 at 89½, and \$1,250,000 at 90.

The following are the whole amount of the bids, and the rates offered.

\$10,000 at.....	91-00
10,000.....	90-87½
15,000.....	90-75
20,000.....	90-62½
20,000.....	90-65
10,000.....	90-52
15,000.....	90-50
30,000.....	90-45
20,000.....	90-37½
10,000.....	90-37
20,000.....	90-35
5,000.....	90-30
100,000.....	90-25
30,000.....	90-15
10,000.....	90-14
10,000.....	90-12½
10,000.....	90-06½
5,000.....	90-06
310,000.....	90-05
25,000.....	90-04
30,000.....	90-03
95,000.....	90-02
2,455,000.....	90-00
100,000.....	89-87½
500,000.....	89-75
10,000.....	89-64
20,000.....	89-62½
10,000.....	89-55
1,540,000.....	89-50
575,000.....	89a89-25
390,000.....	88a89-00
120,000.....	87a88-00
60,000.....	86a87-00
45,000.....	85a86-00

6,635,000

All the bids above 90 were successful, amounting to \$810,000, and the remainder of the bonds were divided *pro rata* among the bidders of 90, giving them about two thirds of the amount each bid for.

#### Pennsylvania.

We learn from the Lancaster, Pa., Gazette that the Safe Harbor Iron Works, located on the Conestoga, are making railroad iron at the rate of 140 rails per day, or 150 tons per week, or 7800 tons per annum. Three steam engines, of the respective capacities of 45, 100 and 125 horse power, are employed in the rolling mill and blast furnace. The number of operatives employed is about five hundred. The cash expenses exceed \$1000 per day.

#### Georgia.

We copy from the Savannah Republican the following statement of the condition of the Central railroad and Banking company, exhibiting its liabilities, resources, and property, which is published for general information:

LIABILITIES.	
To stockholders—for capital stock.....	\$2,851,000 00
" Bill holders—for bank notes circulating.....	198,450 00
" Bond holders—for 7 per ct. bonds outstanding.....	272,600 00
" Bond holders—for 8 per ct. bonds outstanding.....	187 00
" Other banks—for balances due them.....	34,136 62
" Depositors—for deposits.....	156,657 26
" Railroad earnings—for collections since December last.....	409,570 71
" Bank earnings—for discounts & exchanges.....	16,757 97
" Dividends—for old and unclaimed.....	17,978 86
" Reserved fund—laid aside 1st December last.....	71,344 68
	\$4,028,683 10

RESOURCES AND PROPERTY.	
By railroad—cost of buildings, depots, and equipment.....	\$2,850,041 42
" Notes receivable—maturing.....	84,583 06
" Notes receivable—lying over and in suit—(of which are bad \$1,562-40, and doubtful \$10,017 42).....	39,510 99
" Bills of exchange—maturing.....	98,131 68
" Other banks and agencies—balances due by them.....	56,075 85
" Stocks in and loans to other companies.....	271,969 31
" Railroad expenses—repairs, running, &c.....	203,197 25
" Bank expenses—salaries, printing, &c.....	3,767 84
" Extra expenses—arrest of George J. Bulloch, &c.....	7,014 82
" Interest—paid on road bonds.....	11,910 70
" Protest, &c—due on unpaid notes	5 07
" George J. Bulloch—abstracted....	107,188 55
" Real estate—in Savannah and Macon.....	18,812 72
" Specie and specie funds—exchange on the north.....	88,797 89
Specie and notes of other banks.....	187,675 95
	\$4,028,683 10

Earnings of road since 1st Dec. last, as above.....	409,570 71
Earnings of bank since 1st Dec. last, as above.....	16,757 97
Deduct R.R. expenditures.....	203,197 25
Bank expenses.....	3,767 84
Extra do.....	7,014 82
Interest on roads.....	11,910 70
	225,890 61
Nett earnings.....	\$200,438 07
Dividend declared this day \$4 per share.....	114,040 00
Balance carried to reserved fund....	86,398 07
Reserved fund at last settlement, as above.....	71,344 68

June 4th, 1850.

\$157,742 75

#### Tennessee.

**Nashville and Chattanooga Railroad.**—We learn from the Chattanooga Advertiser that the contract for building the section of the Nashville and Chattanooga railroad between Chattanooga and the Tennessee river, on the eastern bank, a distance of twenty-seven miles, also the masonry for the bridge across the river has been taken by John M. Burk, of Pennsylvania. We believe the whole road is now under contract and this last section is to be completed in twenty months. The friends of this

improvement are pushing it ahead with commendable zeal.

#### Massachusetts.

**Midland Railroad.**—The efforts now making to carry out this project, seem to be in a fair way of success. The unfinished portions of the road from Hartford to Boston, are thirty miles from the eastern terminus of the Hartford and Willimantic road to the State line, and fifteen miles from that point to Blackstone, the western terminus of the Norfolk County road, making forty-five miles in all. The city of Hartford, some weeks since, petitioned the Connecticut legislature for leave to lend its credit for half a million of dollars, towards the furtherance of this object, and the committee have reported favorably. If the bill should pass the legislature and be accepted by two-thirds of the legal voters of Hartford city, it will become a law. It is thought that a favorable arrangement will then be made with the landholders and shareholders of the Norfolk County road with a view to merge the whole in one corporation. Nothing has as yet transpired as to the progress made towards getting the stock taken for that portion of the line which extends from South Dedham to Sea street in this city, the charter for which was granted at the last session of our legislature. About 150 shares of Norfolk County railroad stock were sold yesterday at the first and second boards at from \$30½ to \$30½ and subsequently in the afternoon about 200 shares at from \$31 to \$31½ per share. Within a year this stock has been as low as \$17—and as high as \$40.—*Boston Cour.*

#### Railroads between Atlanta and Montgomery.

We learn from the report to the stockholders of the Montgomery and West Point railroad company, that this road is expected to be finished and opened for use to West Point, as early as next October. The road, as far as completed from Montgomery, is now in a highly prosperous condition, paying very good dividends. The receipts for the year ending March 1st, 1850, amounted to about 121,000 dollars.

The Atlanta and LaGrange railroad, which is now progressing rapidly, under the energetic management of those having it in hand, will probably be opened as far as ten miles beyond Newnan, in Boweta Co., by next April. Hence, after that time, through passengers from Charleston to Montgomery, will only be subjected to about thirty-six miles of staging, and the trip will be accomplished in about 36 hours. Present prospects of the roads now being built, warrant the conclusion that by the first of April, 1852, at farthest, the entire line of railroad communication between New York and Montgomery will be perfected, reducing the travelling time between the two points to about four days.

#### Effects of the Free Trade Policy.

The Clinton Whig, published in Clinton county New York, states that of forty-one forge fires on the Saranac river, in 1848, twenty-one had been put out previous to the first of January last, and since that time fourteen of the remaining twenty have also been extinguished—leaving but six of the forty in operation! The Whig adds:

"By the necessary suspension of business, more than five hundred men have been thrown out of work, and over 2000 women and children, dependent upon them for bread, are deprived of the comforts which they have heretofore enjoyed! In addition to these eight of the eighteen fires on the Salmon river have been put out, and others will follow. So on the

Assable. Of the fifty-four there, probably not a dozen will be kept up through the summer.

"At these three points alone, over fifteen hundred men, heretofore earning from \$1 to \$2 per day, will be thrown out of work—and the \$2000 a day which they have been earning, will go, practically, into the pockets of the iron workers of Great Britain."

## AMERICAN RAILROAD JOURNAL.

Saturday, June 15, 1850.

### Balance of Trade.

*Influence of the Exportation of Specie on Production and National Wealth.*

The idea, which was regarded as a fundamental principle by the early school of political economists, that the measure of a nation's wealth was the am't of precious metals it possessed, and that trade was favorable or unfavorable just in proportion as it increased or diminished this amount, is now referred to only as proof of the crude notions which then prevailed upon this subject, and excites a smile that such an absurdity could so long have exerted a controlling influence over the public mind.

This, though a very absurd idea, was a very natural mistake for people to fall into. In the early discussion of any subject, we are apt to mistake phenomena for causes, and the apparent for the real. It was in this way that gold and silver came to be regarded as the only articles to which the term *wealth* could be applied. In all times and among all people have the precious metals been objects of more universal desire than any other articles of property. As a general rule, men are always found willing to part with whatever they can spare for gold and silver, from the value which they possess in their eyes, either for ornament or use. The possessor of them was always certain of being able to supply any of his wants and obtain any other article of property in exchange for these.

This quality of exchangeability possessed by gold and silver to a much greater extent than any other values, naturally led people to the idea that the value of gold and silver was different in *kind* from all others. This mistake was further encouraged by the fact that all contracts were made payable in them, and that the possession of them was the end and object of trade and commerce of every kind.

Experience has long since exploded all such notions as these. Whatever can support labor and become the basis of production—whatever can administer to our wants and luxuries—is, in modern ideas *wealth*; and the nation which is the best off in these respects is justly regarded the richest. Money is neither food nor clothing, and the only use of it is to obtain something which we can eat, drink, or wear—something that adds to comfort; and the person who has purchased such articles, and exchanged for them his gold and silver, is just as rich after the exchange as he was before it took place.

Notwithstanding all this, we still find it to be the fact in the commercial world, that the nation which possesses most of the precious metals, yields by virtue of them a very powerful influence, prejudicial to the interests of all other members of the commercial confederacy. We find in the United States that the moment we begin to ship gold and silver to England, we feel the evil effects of it in commercial embarrassments. Money becomes scarce just in proportion to the extent of the shipment; the value of all kinds of merchandise and property falls, and if the exportation is continued to a great extent, as in 1836-7, a commercial

crisis and general insolvency is the result. The depreciation of property exceeds in value many times the amount of the specie shipped. If on the other hand an equal value in produce should be exported and its return received in gold and silver, the consequence would be an universal appreciation of prices and general commercial prosperity. Now if gold and silver, as a part of national wealth, are not distinguishable from wheat or cotton in any of their characteristics as property, why should their exportation of it be attended with such different results? We will endeavor to explain the apparent anomaly.

As we stated in the outset, gold and silver are objects of universal desire, and enable the possessor of them to obtain with them whatever he may wish. This characteristic which they have over all other kinds of property naturally leads every person to desire to possess as much as possible; or in other words to convert into them all surplus of other kinds of property. All contracts for the same reason were made payable in them, and the value of every article of merchandise came to be measured by the amount of gold and silver it would command.

This is the leading cause which led to the adoption of the precious metals as a medium of exchange. It is based, not upon the caprice, nor upon the conventional agreements of mankind, but upon a law of our nature. Gold and silver possess other characteristics which peculiarly fit them for this purpose, such as the amount and regularity of supply, and the capacity they possess for extreme divisibility without impairing their value; but these are subordinate, and not the leading reasons for their adoption as money.

But though gold and silver are valuable in themselves, and make up a part of the aggregate of national wealth, they are, in one point of view, so much dead capital when employed as money. They are neither food for, nor are they instruments in the hands of labor. In themselves they do not aid in the office of reproduction. They are useful only as agents to facilitate the exchange of articles of use or consumption; and could this exchange be effected without this agency, the amount now used as money might be withdrawn from its present office, and be made the basis of further production. This fact has led to the dispensing with as large an amount as possible from their employment as money, so that we find, that though all contracts are stipulated to be paid in gold and silver, not one in ten thousand are discharged in them. Nearly the whole machinery of commerce is carried on without their actual intervention, by the use of a credit of which they form the basis, while they are seldom removed from the vaults where they are placed for safe keeping.

Were every contract in life necessarily paid in gold and silver, the result would be two fold: the value of them would rise to an exorbitant degree, and business transactions would be curtailed to an equal extent. It would increase the cost of all kinds of merchandise, and diminish the ability of all to purchase. It would reduce production to a mere fraction of what we now witness, and exert a corresponding influence upon the present condition of society, for reasons which are perfectly simple and plain.

Economy of production has led to an almost infinite subdivision of labor; so that the most common article of use passes through many hands in the process of its construction. Some, apparently the most simple, are the joint product of many hundred workmen; it being found that a minute divis-

ion of labor secures a much greater amount of production, and a much more perfect article. The greater part of persons employed in manufacturing have no interest in the article upon which they may be employed; neither does their labor give it a marketable value, till it goes through the hands of the last person in the process. It is the aggregate labor of all that fits it for the market. The great body of workmen employed have no exchangeable value to offer. What they had done or added to any particular article has no marketable value detached from the article itself. They cannot directly exchange the result of their labor for what they must have for their support. They therefore must be paid in *money*, which they can exchange for whatever they may stand in need of.

If there were no such thing as money, and all exchange of products were effected by an "exchange in kind," this would to a very great extent put an end to division of labor, because each person would be compelled to confine himself to the production of exchangeable values: that is, to the *complete* production of one article. If he were a manufacturer of cloth, he would be compelled to perform every step in the process, because no one would buy the article half finished. We should thus lose all we have gained by division of labor. But the evil would by no means end here. The manufacturer, after he had fitted his article for the market, would be obliged to go in pursuit of a customer; and before the right person could be found, the maker would probably lose in time and expense, much more than the cost of production.—Without any further illustration of this part of the subject, it is perfectly easy to see that without money society could have made but little progress, and its disuse would at once reduce us to a semi-civilized state.

We have above spoken of the use of money in the ordinary affairs of life with which we are all conversant. The same views apply with an equal force to foreign as to domestic commerce.

Gold and silver, when used as money, being so much dead property, it for our interest to use only the smallest possible amount of such; and we find that a greater part of the transfers of property are effected without their actual intervention. The exchanges for the most part are effected by the use of credits. Take as a familiar illustration the case of a New England cotton manufacturer. After his fabrics leave his hands, they pass through those of perhaps ten persons before they reach the consumer. He first sends them to his agent in Boston.—He forwards them to a commission house in New York. The New York merchant sells to some Western trader, who in turn sells to another, and so they pass from hand to hand, till they reach the consumer. Now if every person connected with the transfer was obliged to pay the value of the goods to the person who preceded him in it, this fact would require the use of a capital in gold and silver ten times greater than the value of the goods. Each person would be compelled to charge not only for his own labor but a fair compensation for the use of his money. And this additional charge would be so much reduced from the profits of the manufacturer. To save this additional expense, he sells on such time as will allow the goods to reach the consumer, and the pay to come back through the same channel through which they were forwarded; and the only money used in the transaction is that paid by the last purchaser. The manufacturer is thus enabled to receive the full value of his goods, less only the cost of forwarding



to the consumer; and provided only that trusty agents are employed, he makes a much larger profit than he could have made were every transfer effected by the use of money. Experience has proved that in the long run more is saved by giving credits than by selling for cash; and it is upon the reasons here laid down, that credits in mercantile transactions are based. The abolition of credits would to a great extent check the transfer of merchandise, and consequently stop production just in proportion to the additional amount of property that would be required to be changed from a productive to an unproductive state.

But we find that the system of credits is extended still further than in the case cited for illustration; so that the use of gold and silver is dispensed with even in the payments by the consumer, who pays in paper money, which is in itself a credit. Without here going into the history of banks, or the causes which have built up the present system, we find that in the affairs of business the money used has no intrinsic and substantial value. It represents, it is said, *money*, but this is admitted to a certain extent to be a fiction. It is received as money from the credit attached to those who issue it; because it is known that if they have not the specie the bills represent, they have something that will procure it; and that if they do not represent gold and silver, they are based upon substantial values—something that can be exchanged for them. This form of credit enables a community to withdraw an additional amount of the precious metals from its unproductive state as money, equal to the excess of the issue of bills over the amount of specie upon which this issue is based.

In this point of view banking credit adds directly to national wealth, as it enables us to avail ourselves for production of an equal amount of property, which without such would be required for currency. Banking institutions are therefore of equal advantage to all classes, though they seem to be for the exclusive benefit of the rich—as they diminish the rate of interest, facilitate the transfer of property, diminish the cost of products to the consumer, and turn a large amount of property to productive uses.

In popular ideas, bank bills are based upon specie. Though such is not absolutely the fact, yet they never would be received as money unless it was believed that they could be converted into gold and silver at an instant's notice. But as general experience proves that there is no probability that all the bill-holders will present them for redemption at the same time, it is considered a safe rule to issue bills to four or five times the amount of the specie held by the bank. So long as a bank continues in good credit, and possesses convertible property enough to eventually redeem its circulation, the bills are seldom presented for payment.—Money in the shape of bank bills is in a much more convenient form than in the precious metals, and consequently they are preferred to the latter so long as they can be used with safety.

We thus enumerated the causes that have led to the use of paper money, and built up the present banking system of the country. The system has been developed and matured by long experience, and we have a right to suppose that it is the one best adapted to the wants of the mercantile and business community, just as ships and railways are adapted to the office they are to perform. One is just as necessary as the other. Each profession is to be trusted in its calling, and the rules and regulations by which each are guided and controlled, are entitled to respect from all others.

From the premises which we have laid down, it is very easy to draw the conclusion, at which we are aiming. So long as the exchanges of property are effected by credits, as is at present the case, it is very easy to see that the exportation of \$1,000,000 in specie necessarily contracts the circulation of paper five times that amount. Money in consequence becomes scarce, and a greater amount of property than formerly is required to be converted into money to pay a debt contracted before such export. If ten millions are exported, fifty millions of paper money must be withdrawn from circulation. In case of such large exportation, the price of money is so increased, that property which was once ample to pay the debts of a merchant becomes insufficient, and he must fail.—What is true of the individual, is true of the whole community.

In regulating the tariff, therefore, we should be mainly governed by its influence upon the specie of our country. Any system of trade or finance which draws steadily upon our precious metals is a false one, as it must be hostile to all our best interests. The best good of the country is promoted by maintaining in it an uniform amount. Any arrangement of a tariff that will allow such an influx of goods as to withdraw a large amount of it in use, is faulty in the extreme, and should be remedied. We look upon a tariff as more important as a question of finance than protection. The first should always control the last. So long as the balance of trade is in our favor we need no further protection, and we do need it so far as it is necessary to keep it so. If the former is right the latter must be, as the greater must always include the less.

Such we believe to correct views in relation to a tariff. It is simply a question of principle, in which all parts of the country are equally interested, and one in which neither personal nor sectional feeling should have any influence, the South, the North and the West are equally interested in the same rate of duties, established upon the principles we have laid down.

#### Vermont.

The Boston Post says that "the Vermont and Canada Railroad has just concluded a transaction which must benefit the whole chain of roads, the Ogdensburg, Central, and Vermont and Canada. This latter stock, it will be remembered, is guaranteed by the Central to pay 8 per cent. per annum for fifty years. It was first offered to the subscribers of the Central, but only a small portion was taken. A company of gentlemen of this city have now subscribed \$500,000 of the stock, secured, as we understand, by a mortgage of the road, in addition to the Central guaranty. This amount, with the assistance which will probably be received from the Northern and Concord roads, will secure the immediate completion of the Vermont and Canada, pay for the road, and free the Central from a heavy burden on its finances."

#### Banking in Connecticut.

The Legislature of Connecticut has under consideration a general banking law. According to its provisions, the securities to be deposited (at their par value) with the State Treasurer, are stocks of the United States, the States of New York, Massachusetts, Ohio, the cities of New York and Boston, and any incorporated city in Connecticut.—The treasurer and school fund commissioners constitute a board of control, who are authorized and required to meet once a month to examine the securities deposited. If, in their opinion, there are not sufficient to protect the circulation, then it is their duty to require additional security forthwith, and

if it is not furnished within ten days, then the Superior Court appoints a receiver, who immediately winds up the affairs. Stockholders are individually liable for the indebtedness of the bank.

#### Railroads from the Mississippi Valley to the Seaboard.

*Some of the Results thereof now Evincing, but heretofore unlooked for.*

When the cities on the seaboard first commenced their respective lines of artificial communication with "the great west," it was supposed that these lines would (at least for a long series of years) be chiefly required to bring to us the surplus agricultural staples of that west, and to take back in exchange the fabrics of iron, wool, cotton and even wood; that the profits of making these exchanges would always enure to our benefit, and would increase our population, add to the value of our land, and secure to us the controlling influence in matters of finance, commerce, and the general policy of the government. Very few then dreamed of ever hearing of a nail factory at Pittsburgh, or machine shop at Cincinnati, or cotton mill in Indiana, or a sugar refinery in St. Louis. Had any one then predicted that Georgia osnaburgs would be sold in New York within this century he would have been regarded as a fool or a madman.

Temporarily, each line referred to has, to a great extent, effected the objects in view. Baltimore has been doubly repaid for her expenditure in the railroad to Cumberland by the advance on her real estate. Philadelphia has increased with astounding rapidity, from making herself the terminus of roads and canals into and through the Alleghanies. New York has retained her relative importance, by her magnificent works that connect her with the great lakes. Boston has extended her boundaries far beyond her peninsula by throwing her "grappling irons" over every important water fall in New England, and by connecting the grain fields of the west with the markets of her tributary manufacturing towns. Perhaps these cities have all made a wise expenditure. But new elements are now unexpectedly arising, and are beginning to exert a force of which we can, as yet, hardly understand the strength.

These roads and canals have connected and made us familiar with a vast country of lands and minerals and products richer than our own. They have facilitated the movements of emigrants through our country, to that which holds out greater attractions. They have been the means of transporting the arts and sciences, and conveniences and luxuries; in short, all the means of social comfort and high enjoyment to pursuits where, but a few years ago, the Indian roamed in solitude. They have shortened the agricultural age of the Ohio valley to a period measured by tens instead of hundreds of years. They are now bringing us the products of Pittsburgh Wheeling, and Cincinnati workshops. St. Louis offers an extended sphere of operations to our merchants and bankers; Nashville bids highest for our professors, and Louisville is in the market for our preachers. Ohio, Indiana and Illinois have added good schools, commenced churches, and good roads to the schedule of their attractions to our people who have preferred sandy and rocky farms to fertile and cheap lands in a wilderness.

The result of all this is evident—inevitable. Our spinners and weavers will now go where cotton and wool and food are cheapest. Our furnaces must be closed if those on the Tennessee river can get iron ore at one-third its cost to us. Our

farmers will not hold lands at \$100 per acre when they can buy lands on the Wabash of a better quality, and as near to a school house as their own, for \$5 an acre. Had it not been for these roads, the valley of the Wabash would still be to us a "terra incognita." But the roads will produce an equilibrium, and, as the western valley is so extensive, must not our lands, at least those not in the immediate vicinity of cities, fall to the common level? Here are problems of which time is rapidly affording solutions, and the statistics of our census of 1850 will furnish data from which the statesman and man of business may read many a lesson not embraced in his present course of study.

In a recent lecture before an association at Cincinnati, published and endorsed by Judge Burnet and three leading men of that city, the writer, Mr. Tapt, has referred to Jappa and Jerusalem, Havre and Paris as indicative of the future relative position and importance of our cities on the seaboard to a city or cities in the interior. This looks to be and perhaps is a rich specimen of *extravagance*. But the growth of these interior departments may warrant expectations of the most brilliant hue in the minds of those who are a part of that growth.

We look at the increase of the population and wealth and the diversity of pursuits in that valley as the certain causes of the continued growth of our seaboard cities, and especially of New York. Suppose that the peaceful and untaxed west, rich in minerals, food and fibrous staples, should produce fabrics of iron, wool and cotton cheaper than England or any other country. The tide of business would still run by us. We should still be the central point of exchange, the great mart of commerce. We should be to the manufacturers over the mountains what Liverpool and London are to the manufacturing districts of England.

The next generation may see this change. The natural elements of our progress are vastly more powerful than are those on which have rested the manufacturing supremacy of Great Britain. Skill and capital are of easy acquirement, and the natural must, sooner or later, overcome the artificial.

### Patent Self-clinching Railroad Spikes.



These spikes have been in use upon various roads for several years, and have met with universal approval by Engineers. They drive in the manner shown, turning themselves, and are therefore not liable to work loose. They will prove of great value to secure the chair.

We are also manufacturing railroad spikes, hook and flat head; wrought chairs, clamps, etc., of superior quality, and are prepared to contract for any pattern or weight upon favorable terms.

SMITH & TYSON,

25 South Charles st., Baltimore Md.

### Stickney & Beatty, DEALERS IN IRON AND IRON MANUFACTURERS.

AGENTS for the Balt. City Rolling Mill, from which establishment they are prepared to furnish Ellcott's round, square, and flat bar iron, puddled and charcoal boiler plates and billet iron—also agents for the sale of the Laurel and Maryland (Balt.) charcoal forge pig irons, Balt. hard iron for churning wheels, anti-Eaton nails, Catoctin foundry iron, boiler blooms from the Caledonian works, Wm. Jessop & Son's cast steel, Coleman's blister steel and nail rods, hoop, band, sheet, oval and common English iron.

Nos. 18 and 30 South Charles st., Baltimore.

### Ray's Patent India Rubber Car Springs.

Connecticut River Railroad Office, }  
Northampton, May 4, 1850. }

E. CRANE, Esq.,

Dear Sir: It is now about two years since I first tried the experiment of using a set of Ray's India-rubber Springs upon one of our merchandise cars, and although the car has been in constant service since that time, I do not on examination find the slightest difference either in the thickness or elasticity of the material.

The same result has followed wherever we have applied them, either for wheel or draw springs on Engines, Tenders or Cars. At present we use no other; either in replacing old springs or building new cars—and I am perfectly satisfied that for economy, durability, safety, and ease of motion, that Ray's India-rubber is the best article for Springs which has been presented to the public.

Yours respectfully, J. HUNT,  
Supt. Connecticut River Railroad.

EDWARD CRANE, Esq.,

Dear Sir: Having applied to cars of the Boston and Worcester Railroad Corporation, Ray's Vulcanised Rubber Springs (where they have been in use for some two years last past), I have had occasion to observe their operation, and am free to say in answer to your inquiries, that they retain their elasticity perfectly during all changes of atmospheric temperature; and are in my opinion a most valuable acquisition to Railroad Cars—are not liable to derangement, as is the case with steel springs; while at the same time it costs less to apply them. Respectfully yours,

D. N. PICKERING,

Supt. Motive Power, Bost. & Wor. Railroad.  
Boston, April 15th, 1850.

### Notice to Contractors.

PROPOSALS will be received by the Subscribers at Portland, until the 21st instant, for the Grading and Masonry of that portion of the Atlantic and St. Lawrence Railroad, lying between Bethel Village, in the State of Maine, and the Town of Gorham, in New Hampshire—a distance about 25 miles.

Plans and profiles will be in readiness for examination after the 15th inst., at the Engineer's office in Bethel—or at the office of the Subscribers, in Portland.

Contractors of experience, and means, will find this notice worthy their attention—as the line embraces much heavy work, and the character of the earth and rock being of the most desirable description.

Spirituous Liquors will not be allowed on or about the work—nor will the proposals of Contractors be considered, who have heretofore failed to pay the Laborers employed by them on this or any other public work.

Cash payments will be made monthly, reserving 10 per cent. until the final completion of the contract.

WOOD, BLACK & CO.

Portland, June 10, 1850.

### NOTICE.

A young man of experience in Surveying wishes a situation on a Railroad as an Assistant. Please apply at this office.

### NORRIS' LOCOMOTIVE WORKS, SCHENECTADY, N. Y.

THESE Works are in full operation in Manufacturing to order, Locomotive Steam Engines & Tenders, of the best principle and construction of material, using wrought iron heavy frames with pedestals welded thereto, and all parts of the engine made of the best wrought iron, except cylinders, pumps and boxes—obtaining greater durability, and carrying less weight over the road, than engines constructed of cast iron.

Wrought Iron Tires made any required size, and Tire Bars bent and welded with dispatch.

Chilled Wheels for Cars, Trucks and Tenders, made from the toughest iron.

Driving and Tender and Car Wheels fitted to Axles with Brass Boxes and Springs, and Railroad Machinery generally. Manufactured and for sale by

April 11, 1849.

E. S. NORRIS.

### Theodolite for Sale.

A FIRST RATE 5 INCH THEODOLITE for sale at a bargain. Enquire at the Railroad Journal Office.

### Election of an Engineer.

At a Meeting of the Board of Directors of the Virginia Central Railroad Co. at Charlottesville on the 4th day of June, 1850,

Resolved, That the election of a Chief Engineer in the place of Wm. A. Kuper, whose resignation has been accepted, is postponed to take place in Richmond on Tuesday the 18th of June instant.

A copy from the minutes.

JOHN GARRET, Secretary.

### Lovegrove's Patent Cast Iron Water and Gas Pipes.

THE Subscriber, the Inventor and Patentee of the Centrifugal mode of giving form to metallic substances while in a molten state, is preparing to make Cast Iron Water and Gas Pipes, of any dimensions, at prices much lower than they can be made in the old manner, and the pipes warranted to stand a pressure of three hundred pounds to the square inch, and to be soft enough to drill. Steam Engines and all kinds of machinery. Cast Iron Doors and Frames, and Mill Castings of every description, made to order.

THOMAS LOVEGROVE,

Machinist and Founder,

West Falls Avenue, below Pratt st., Baltimore.

### American Railway Guide, AND POCKET COMPANION FOR THE UNITED STATES;

CONTAINING Correct Tables, showing the time for starting of trains from all stations, distances, fares, etc., on all the Railway lines in the U. States; also many of the principal Steamboat and Stage routes—accompanied by a complete RAILWAY MAP. Price, single copies 12½ cts., or \$1 per annum. Published on the first of every month, corrected from returns furnished by the Railway Superintendents throughout the Union.

This book has been compiled somewhat on the plan of Bradshaw's Guide, with such improvements in size, form and arrangement as have seemed desirable; and the publisher confidently hopes it will not be found liable to the objections of incompleteness and incorrectness, which have been made, and justly too, against various other similar works heretofore issued.

The subscriber having had the management of the NEW YORK PATHFINDER almost from its commencement, has enjoyed superior facilities in obtaining information relating to the thoroughfares of travel, and is therefore well qualified to prosecute with success the arduous undertaking of furnishing a complete and correct national guide book.

STRINGER & TOWNSEND, General Agents, 222 Broadway: and sold also by Booksellers and Periodical Dealers generally throughout the country; also on all the Railways and Steamboats.

CURRAN DINSMORE, Publisher.

N. Y. Pathfinder Office,  
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### India-rubber for Railroad Cos.

RUBBER SPRINGS—Bearing and Buffer—Fuller's Patent—Hose from 1 to 12 inches diameter. Suction Hose. Steam Packing—from 1-16 to 2 in. thick. Rubber and Gutta Percha Bands. These articles are all warranted to give satisfaction, made under Tyer & Helm's patent, issued January, 1849.—No lead used in the composition. Will stand much higher heat than that called "Goodyear's," and is in all respects better than any in use. Proprietors of railroads do not be overcharged by pretenders.

HORACE H. DAY,

Warehouse 23 Courtlandt street.

New York, May 21, 1849.

### To Railroad Companies.

FOR SALE—A Second-hand Locomotive Engine and Tender, of about 10 tons weight, in good order, and warranted to perform well. Any company wanting a cheap engine for a passenger or light burden train, will rarely meet with an opportunity so favorable as the present. The engine and tender are in perfect running order, and will be tested to the satisfaction of any one wishing to purchase. Price \$1,500.

Address J. B. MOORHEAD,

Frazer P.O., Chester county, Pa.

P.S.—The Engine can be seen by calling on H. Osmond & Co., Car-builders, Broad st., Philadelphia.

September 6, 1849.

### Spikes, Spikes, Spikes.

ANY person wishing a simple and effective Spike Machine, or a number of them, may be supplied by addressing J. W. FLACK, Troy, N. Y.

March 6, 1850.



**Great American Engineering**

**AND MECHANICAL WORK**, just published in a medium folio, 75 cts. to Subscribers, One Dollar to non-subscribers.

Part V of "Specimens of the Stone, Iron and Timber Bridges, Viaducts, Tunnels, &c. &c. of the United States Railroads." By George Duggan, Architect and Civil Engineer.

The present part contains beautifully executed plans, elevations and sections of the Timber Viaduct across the Canewacta Creek at Lanesboro', Pa., and the Details of the Starucca, (stone) Viaduct near Lanesboro', Pa., on the line of the N. Y. & Erie R. R., with the specifications, estimates, etc.

N.B.—This work is published by subscription of the most eminent in the engineering profession of the U. States, and will be completed in 12 parts, at 75 cents each to those who remit their names and subscriptions before the 1st June next—when the first 6 parts or one half of the work will be published—after which the price will be raised to \$1 per part.

To those making a present remittance of \$5, and the remainder \$4, when they have been supplied with the first six parts, the work will be forwarded regularly as published. Parties remitting \$9 shall receive it monthly post-free in any part of the United States.

"It is a work that was a great desideratum, and must prove of great benefit to the engineering profession generally, and especially to the tyro in practical engineering and mechanical knowledge; in truth it strikes us, that it would require years of labor and patient toil on the part of a young engineer to prepare the drawings, and collect the information that will be embodied in this work, and can now be secured for the trifling sum of \$9"—[Scientific Amer. March 16, 1850.]

In connection with this subject (Iron Railroad Structures) we take occasion to call attention again to Mr. Duggan's valuable and expensive publication, exhibiting drawings, with full descriptions of the various stone, iron and wooden bridges, viaducts, tunnels, culverts, etc., of all the Railroads in the United States. Mr. Duggan is an accomplished Architect and Civil Engineer, who came from Ireland to this country to exercise his profession; but finding Railroad construction here, in many respects, different from that he had been accustomed to in Europe, he applied himself to the study of our system; and the fruits of his researches and investigations embodied in this work, are well calculated to meet the exigencies of engineers, and to assist draughtsmen, bridge builders, mechanics and students.—[N. Y. Journal of Commerce, Feb. 14, 1850.]

Published by **GEORGE DUGGAN**,  
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To whom all communications should be addressed, and subscriptions forwarded.

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IMPORTERS AND FURNISHERS

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"Crimson" "Crimson" (Elegant.  
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JNO. W. A. STRICKLAND, Agent.  
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Best Cast Steel Royal Improved Files, well known as better adapted for Engineers' and Machinists' purposes than any now in use in the United States.

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THE Subscribers have constantly on hand Rafford's Stourbridge, Oak Farms Stourbridge, Lister, Wortley, Red and White Welsh Fire Bricks, common and fancy shapes. Also,

**ROOFING SLATES,**

from the best Welch quarries, and of all sizes. Also,

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of all kinds—Liverpool Orrell and Cannel, Scotch, New Castle, Pictou, Sidney, Cumberland, Virginia, and all kinds of Anthracite coals. Also,

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No other scales are so extensively used upon railroads, either in the United States or Great Britain;—and the managers refer with confidence to the following in the United States.

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April 22, 1849. 1y\*17

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Securely invested in Bonds and Mortgages on real estate in this city and Brooklyn, and stocks of the State and City of New York and United States Government.

The company declared a dividend of profits of fifty-two per cent. on all existing policies on the 31st of January, 1848.

**All the Profits are Divided Among the Insured.**

Persons may effect insurance on their own lives and the lives of others.

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Pamphlets explanatory of the principles of Mutual Life Insurance, and illustrating its advantages, with forms of application, may be obtained at the office of the company, 35 Wall street, or of any of its agents.

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John C. Cruger,	Eugene Dutilh,
Walter Joy,	Francis S. Lathrop,
Alfred Pell,	John C. Thatcher.

**JOSEPH B. COLLINS**, President.  
**ISAAC ABBATT**, Secretary. 3m9

**NOTICE TO****Superintendents of Railroads.**

**TYLER'S PATENT SAFETY SWITCH.**—The undersigned would respectfully call their attention to his Patent Safety Switch, which from long trial and late severe tests has proved itself perfectly reliable for the purpose for which it was intended. It is designed to prevent the train from running off when the switch is set to the wrong track by design or accident. The single rail or gate switch is established as the best and safest switch for the ordinary purpose of shifting cars from one track to another, but it is liable to the serious evil of having one track open or broken when connected with the other. My improvement entirely removes this evil, and while it accomplishes this important office, leaves the switch in its original simplicity and perfection of a plain unbroken rail, connecting one track with the other ready for use.

The following decision of the Commissioner of Patents is respectfully submitted to Railroad Engineers, Superintendents, and all others interested in the subject.

(COPY.)

**UNITED STATES PATENT OFFICE,**

Washington City, D.C., April 28th, 1846.

SIR: You are hereby informed that in the case of the interference between your claims and those of Gustavus A. Nicolls, for improvements in safety switches—upon which a hearing was appointed to take place on the 3d Monday in March, 1846, the question of priority of invention has been decided in your favor. Inclosed is a copy of the decision. The testimony in the case is now open to the inspection of those concerned.

Yours respectfully,  
**EDMUND BURKE,**  
Commissioner of Patents.

To Philo B. Tyler.

Any further information may be obtained by addressing P. B. TYLER, Springfield, Mass., or JOHN PENOLETON, Agent, 149 Hudson St., New York.

**Coal.**

**CUMBERLAND SEMI-BITUMINOUS COAL**  
superior quality for Locomotives, for sale by

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1m19

May 12, 1849.

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Having recently constructed the above works, are prepared to construct at short notice all kinds of

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Passenger Cars of all classes—Open and Covered Freight and Express Cars—Coal Cars—Hand Cars & Trucks of all descriptions.

They are also prepared to furnish Chilled Wheels of any pattern. Car Wheels & Axles fitted and furnished. Snow Ploughs and Tenders made to order. Steel and other Springs always on hand.

All orders will be filled at short notice, and upon as good terms as at any other establishment in the country. Omnibuses from the Exchange run within one square of the manufactory every 10 minutes during the day.

Philadelphia, June 16, 1849. 1y25

**C. W. Bentley & Co.,**

**IRON Founders, Portable Steam Engine Builders**  
and **Boiler Makers**, Corner Front and Plowman Sts., near Baltimore St. Bridge,

**BALTIMORE, MARYLAND.**

Their Engines are simple in their construction, compact and durable; they require no brick work in setting them, and occupy but a small space (a six horse power engine and boiler, standing on a cast iron plate of three by six feet.)

They also manufacture Major W. P. Williamson's new oscillating Engine; a superior article, combining cheapness and simplicity (one of which may be seen in operation at their shop.) Both of these engines are adapted to any purpose, where power is required, and may be made of any capacity; and for economy in use of fuel are unsurpassed.

All kinds of machinery made to order. Steam Generators, Force Pumps, Wrought Iron Pipes and Fittings for Steam, Water, Gas, etc., constantly on hand,  
Baltimore, June 6, 1849.

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THIS article now extensively used for the preservation of timber, is manufactured and for sale by **POWERS & WEIGHTMAN**, manufacturing Chemists, Philadelphia.

Jan. 20, 1849.

**ENGINEERS.**

**Atkinson, T. C.,**  
Alexandria and Orange Railroad, Alexandria, Va.

**Bancks, C. W.,**  
Civil Engineer, Vicksburg, Miss.

**Berrien, John M.,**  
Michigan Central Railroad, Marshall, Mich.

**Buckland, George,**  
Troy and Greenbush Railroad.

**Clement, Wm. H.,**  
Little Miami Railroad, Cincinnati, Ohio.

**Cozzens, W. H.,**  
Engineer and Surveyor, St. Louis, Mo.

**Alfred W. Craven,**  
Chief Engineer Croton Aqueduct, New York.

**Davidson, M. O.,**  
Eckhart Mines, Alleghany Co., Maryland.

**Fisk, Charles B.,**  
Cumberland and Ohio Canal, Washington, D. C.

**Felton, S. M.,**  
Fitchburg Railroad, Boston, Mass.

**Floyd-Jones, Charles,**  
South Oyster Bay, L. I.

**Gzowski, Mr.,**  
St. Lawrence & Atlantic Railroad, Montreal, Canada.

**Gilbert, Wm. B.,**  
Rutland and Burlington Railroad, Rutland, Vt.

**Grant, James H.,**  
Nashville and Chattanooga R. R., Nashville, Tenn.

**S. W. Hill,**  
Mining Engineer and Surveyor, Eagle River,  
Lake Superior.

**Holcomb, F. P.,**  
Southwestern Railroad, Macon, Ga.

**Johnson, Edwin F.,**  
New York and Boston Railroad, Middletown Ct.

**Latrobe, B. H.,**  
Baltimore and Ohio Railroad, Baltimore, Md.

**Miller, J. F.,**  
Worcester and Nashua Railroad, Worcester, Mass.

**Morris, Elwood,**  
Schuylkill Navigation, Schuylkill Haven, Pa.

**Morton, A. C.,**  
Atlantic and St. Lawrence Railroad, Portland, Me.

**McRae, John,**  
South Carolina Railroad, Charleston, S. C.

**Nott, Samuel,**  
Lawrence and Manchester Railroad, Boston.

**Prichard, M. B.,**  
East Tennessee and Georgia R. R., Cleveland, Tenn.

**Roebbling, John A.,**  
Trenton, N. J.

**W. Milnor Roberts,**  
Bellefontaine and Indiana Railroad, Marion, Ohio.

**Roberts, Solomon W.,**  
Ohio and Pennsylvania Railroad, Pittsburgh, Pa.

**Sanford, C. O.,**  
South Side Railroad, Virginia.

**Schlatter, Charles L.,**  
Northern Railroad (Ogdensburg), Malone, N. Y.

**Sours, Peter,**  
Rahway, New Jersey.

**Stark, George.,**  
Bost., Con. and Mont. R. R., Meredith Bridge, N. H.

**Steele, J. Dutton,**  
Pottstown, Pa.

**Trimble, Isaac K.,**  
Philad., Wil. & Baltimore Railroad, Wilmington, Del.

**Tinkham, A. W.,**  
United States Fort, Bucksport, Me.

**Thomson, J. Edgar.,**  
Pennsylvania (Central) Railroad, Philadelphia.

**Troost, Lewis,**  
Alabama and Tennessee Railroad, Selma, Ala.

**Whipple, S.,**  
Civil Engineer and Bridge Builder, Utica, N. Y.

**Williams, E. P.,**  
Auburn and Schenectady Railroad, Auburn, N. Y.

**Williams, Charles H.,**  
Milwaukee, Wisconsin.

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" Barston, Pope & Co., "  
" Earps & Brink, Philadelphia.  
" E. Pratt & Brother, Baltimore.  
John Barstow, Esq., Providence.  
Lewis Bullard, Esq., Boston.  
February 9, 1850. 6m\*

**United States Railroad Guide and Steamboat Journal.**  
CONTAINING OFFICIAL TIME ADVERTISEMENTS, Tables of Stations, Distances, Fares, Time, etc., with much miscellaneous matter for the travelling public. Price 12 cents a copy. Yearly subscription \$1. Published at 43 Ann street, New York.

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A full Stock of Steel and Files at all times on hand. 6m4

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WILLOW ST. WHARVES, PHILADELPHIA.  
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Pig Iron, Hammered Railroad Car and Locomo-  
tive Axles, Force Pumps of the most approved con-  
struction for Railroad Water Stations and Hydraulic  
Rams, etc., etc.  
July, 27, 1849.

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OF THE UNITED STATES NAVY YARD,  
PENSACOLA, FLORIDA.,

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### HERRON RAILWAY TRACK.

Models of this Track, on the most improved plans,  
may be seen at the Engineer's office of the New York  
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**NORRIS' LOCOMOTIVE WORKS,**  
SCHENECTADY, NEW YORK,  
Are Manufacturing Wrought Iron Driving, Truck,  
Tender, and Car Wheels—made from the best Ameri-  
can Iron. Address E. S. NORRIS.  
May 16, 1849.

### Machinery Warehouse.

S. C. HILLS, No. 43 Fulton street, New York, has  
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Chucks, Drills, Planers, Force and Suction Pumps;  
Tenoning, Mortising and Boring Machines, Shingle  
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and Lead Pipe; Rubber, Percha and Leather Hose,  
&c., &c.

S. C. H.'s arrangements with several machine shops  
are such that he can supply, at very short notice, large  
quantities of machinery.  
November 23, 1849.

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Bar Iron, Lead, Spelter, Tin, Copper, etc.,  
No. 4 Liberty Place, MAIDEN LANE,  
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### Manufacture of Patent Wire ROPE AND CABLES,

For Inclined Planes, Suspension Bridges, Standing  
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TRENTON, N. J.

### Samuel D. Willmott, MERCHANT, AND MANUFACTURER OF CAST STEEL WARRANTED SAWS,

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ANALYTICAL & CONSULTING CHEMISTS,  
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SCHOOL OF CHEMISTRY.

### IRON.

#### Railroad Iron.

**3,000 TONS C. L. MAKE** 63½ lbs. per yard,  
now landing and to arrive.  
Also contracts made for future delivery of above su-  
perior make English Iron.  
300 Tons Banks Best Iron, Round, Square and Flat.  
200 " English Bar " " "  
10 " 9-16 Square Iron for Railroad Spikes.  
For sale in lots to suit purchasers by  
DAVID W. WETMORE.  
New York, March 26, 1850. 3m

**SPRING STEEL FOR LOCOMOTIVES, TEN-  
DERS AND CARS.**—The subscriber is engaged  
in manufacturing spring steel from 1½ to 6 inches in  
width, and of any thickness required: large quantities  
are yearly furnished for railroad purposes, and wher-  
ever used its quality has been approved of. The estab-  
lishment being large, can execute orders with great  
promptitude, at reasonable prices, and the quality war-  
ranted. Address J. F. WINSLOW, Agent,  
Albany Iron and Nail Works.

#### Railroad Iron.

THE UNDERSIGNED, Agents for Manufacturers, are  
prepared to contract to deliver Rails of superior  
quality, and of any size or pattern, to any ports of dis-  
charge in the United States.  
COLLINS, VOSE & CO.,  
74 South St.  
New York, June 1, 1850.

#### Railroad Iron.

1,500 Tons weighing 58 lbs. per lineal yard.  
500 " " 57 " " "  
500 " " 56 " " "  
500 " " 60 & 61 lbs, " "  
Also 2½x½ flat rails. All the above being of approv-  
ed patterns. For sale by  
DAVIS, BROOKS, & CO.,  
68 Broad street.

N.B.—Rails imported on commission, or at a fixed  
price.

#### Iron.

Pig Iron, Anthracite and Charcoal; Boiler and Flue  
Iron, Spring and Blistered Steel, Nail Rods, Best Re-  
fined Bar Iron, Railroad Iron, Car Axles, Nails, Stove  
Castings, Cast Iron Pipes of all sizes, Railway Chairs  
of approved patterns for sale by  
COLEMAN, KELTON & CABELL,  
109 N. Water St., Philadelphia.

**IRONDALE PIG METAL, MANUFACTURED**  
and for sale by the Bloomsburg Railroad Iron Co.  
LINDLEY FISHER, Treasurer.  
75 N. Water St., Philadelphia.

#### Railroad Iron.

**2000 Tons**, weighing 58 pounds per lineal yard,  
of the most approved pattern of T rails, in  
store and to arrive, for sale by  
COLLINS, VOSE & CO.,  
74 South St.  
New York, June 1, 1850.

#### Railroad Iron.

**1675 Tons**, weighing about 61 lbs. per yard, 90  
tons, weighing about 52 lbs. per yard, and  
825 tons, weighing about 53½ lbs. per yard, of the lat-  
est and most approved patterns of T rails, for sale by  
BOORMAN, JOHNSTON & CO.,  
119 Greenwich street.  
New York, Feb. 25, 1850.

N.B.—B., J. & Co are also prepared to take con-  
tracts for English rails, delivered in any of the Atlan-  
tic ports of the United States.

#### Railroad Iron.

THE UNDERSIGNED, HAVING made arrange-  
ments abroad, are prepared to contract for the de-  
livery of Foreign rails, of approved brands upon the  
most favorable terms.  
They will also make contracts for American rails,  
made at their Trenton works, from Andover Iron, in  
whole or in part, as may be agreed upon.  
They are prepared to furnish Telegraph, Spring and  
Market Wire; Braziers and Wire Rods; Rivets and  
Merchant Bars to order, all made exclusively from An-  
dover Iron. The attention of parties who require iron  
of the very best quality for special purposes, is respect-  
fully invited.  
COOPER & HEWITT,  
17 Burling Slip, New York.

February 15, 1850.

### Glendon Refined Iron.

Round Iron, Band Iron, Hoop Iron,  
Square " Flat " Scroll "

Axles, Locomotive Tyres,

Manufactured at the Glendon Mills, East Boston, for  
sale by  
GEORGE GARDNER & CO.,  
5 Liberty Square, Boston, Mass.  
Sept. 15, 1849. 3m37

**PATENT HAMMERED RAILROAD, SHIP &  
BOAT SPIKES.**—The Albany Iron Works  
have always on hand, of their own manufacture, a  
large assortment of Railroad, Ship and Boat Spikes  
from 2 to 12 inches in length, and of any form of head  
From the excellence of the material always used in  
their manufacture, and their very general use for rail-  
roads and other purposes in this country, the manu-  
facturers have no hesitation in warranting them fully  
equal to the best spikes in market, both as to quality  
and appearance. All orders addressed to the subscrib-  
ers at the works will be promptly executed.

JOHN F. WINSLOW, Agent.

Albany Iron and Nail Works, Troy, N. Y.  
The above Spikes may be had at factory prices, o  
Erastus Corning & Co Albany; Merritt & Co., New  
York; E. Pratt & Br., 1st, Es. Amers. Md

### LAP—WELDED WROUGHT IRON TUBES

FOR

#### TUBULAR BOILERS,

FROM ONE AND A QUARTER TO SEVEN  
INCHES IN DIAMETER.

THE ONLY Tubes of the same quality and man-  
ufacture as those so extensively used in England,  
Scotland, France and Germany, for Locomotive, Ma-  
rine and other Steam Engine Boilers.  
THOMAS PROSSER & SON, Patentees,  
28 Platt street, New York.

#### Railroad Iron.

THE UNDERSIGNED ARE PREPARED TO  
contract for the delivery of English Railroad Iron  
of favorite brands, during the Spring. They also re-  
ceive orders for the importation of Pig, Bar, Sheet, etc.  
Iron.  
THOMAS B. SANDS & CO.,  
22 South William street,  
New York.  
February 3, 1849.

#### Iron Store.

THE Subscribers, having the selling agency of the  
following named Rolling Mills, viz: Norristown,  
Rough and Ready, Kensington, Triadelphia, Potts-  
grove and Thorndale, can supply Railroad Companies,  
Merchants and others, at the wholesale mill prices for  
bars of all sizes, sheets cut to order as large as 58 in.  
diameter; Railroad Iron, domestic and foreign; Loco-  
motive tire welded to given size; Chairs and Spikes;  
Iron for shafting, locomotive and general machinery  
purposes; Cast, Shear, Blister and Spring Steel; Bol-  
ter rivets; Copper; Pig iron, etc., etc.  
MORRIS, JONES & CO.,  
Iron Merchants,  
Schuylkill 7th and Market Sts., Philadelphia.  
August 16, 1849. 1y33

#### Railroad Iron.

THE MOUNT SAVAGE IRON WORKS, AL-  
legany county, Maryland, having recently pass-  
ed into the hands of new proprietors, are now prepar-  
ed, with increased facilities, to execute orders for any  
of the various patterns of Railroad Iron. Communi-  
cations addressed to either of the subscribers will have  
prompt attention. J. F. WINSLOW, President  
Troy, N.Y.

ERASTUS CORNING, Albany;  
WARREN DELANO, Jr., N.Y.  
JOHN M. FORBES, Boston.  
ENOCH PRATT, Baltimore, Md.

November 6, 1848.

#### Railroad Iron.

THE SUBSCRIBERS ARE PREPARED TO  
take orders for Railroad Iron to be made at their  
Phoenix Iron Works, situated on the Schuylkill Riv-  
er, near this city, and at their Safe Harbor Iron Works,  
situated in Lancaster County, on the Susquehanna  
river; which two establishments are now turning out  
upwards of 1800 tons of finished rails per month.  
Companies desirous of contracting will be promptly  
supplied with rails of any required pattern, and of the  
very best quality.

REEVES, BUCK & CO.  
45 North Water St. Philadelphia.

March 15, 1849.

**Monument Foundry.**

**A. & W. DENMEAD & SON,**  
Corner of North and Monument Sts.,—Baltimore,  
HAVING THEIR

**IRON FOUNDRY AND MACHINE SHOP**

In complete operation, are prepared to execute faithfully and promptly, orders for Locomotive or Stationary Steam Engines, Woolen, Cotton, Flour, Rice, Sugar Grist, or Saw Mills, Slide, Hand or Chuck Lathes, Machinery for cutting all kinds of Gearing, Hydraulic, Tobacco and other Presses, Car and Locomotive patent Ring Wheels, warranted, Bridge and Mill Castings of every description, Gas and Water Pipes of all sizes, warranted, Railroad Wheels with best faggotted axle, furnished and fitted up for use, complete

Being provided with Heavy Lathes for Boring and Turning Screws, Cylinders, etc., we can furnish them of any pitch, length or pattern.

Old Machinery Renewed or Repaired—and Estimates for Work in any part of the United States furnished at short notice.

June 8, 1849.

**Iron Wire.**

**REFINED IRON WIRE OF ALL KINDS,**  
Card, Reed, Cotton-flyer, Annealed, Broom, Buckle, and Spring Wire. Also all kinds of Round, Flat or Oval Wire, best adapted to various machine purposes, annealed and tempered, straightened and cut any length, manufactured and sold by

**ICHABOD WASHBURN.**

Worcester, Mass., May 25, 1849.

**American and Foreign Iron.****FOR SALE,**

300 Tons A 1, Iron Dale Foundry Iron.  
100 " 1, " " "  
100 " 2, " " "  
100 " " Forge " "  
400 " Wilkesbarre " "  
100 " "Roaring Run" Foundry Iron.  
300 " Fort " "  
50 " Catocin " "  
25c " Chikiswalungo " "  
56 " "Columbia" "chilling" iron, a very superior article for car wheels.  
75 " "Columbia" refined boiler blooms.  
30 " 1 x 1/2 Slit iron.  
50 " Best Penna. boiler iron.  
50 " "Puddled" "  
50 " Bagnall & Sons refined bar iron.  
50 " Common bar iron.

Locomotive and other boiler iron furnished to order.

**GOODHUE & CO.,**

New York.

64 South street

**American Pig, Bloom and Boiler Iron.**

**HENRY THOMPSON & SON,**  
No 57 South Gay St., Baltimore, Md.,  
Offer for sale, Hot Blast Charcoal Pig Iron made at the Catocin (Maryland), and Taylor (Virginia), Furnaces; Cold Blast Charcoal Pig Iron from the Cloverdale and Catawba, Va., Furnaces, suitable for Wheels or Machinery requiring extra strength; also Boiler and Flue Iron from the mills of Edge & Hilles in Delaware, and best quality Boiler Blooms made from Cold Blast Pig Iron at the Shenandoah Works, Va. The productions of the above establishments can always be had at the lowest market price for approved paper.

American Pig Iron of other brands, and Rolled and Hammered Bar Iron furnished at lowest prices. Agents for Watson's Perth Amboy Fire Bricks, and Rich & Co's New York Salamander Iron Chests.

Baltimore, June 14, 1849.

6 mos

**Wheel, Forge and Foundry Iron.**

**LOCUST GROVE** Wheel Iron of great strength and superior chilling property.  
Balt. Charcoal Forge Iron, from Patuxent, Curtis Creek and Gunpowder furnaces.

Elkridge Foundry Iron, of superior strength and softness. Anthracite and Charcoal Iron from Pennsylvania and Virginia. Gas and Water Pipes, Lamp Posts from Elkridge furnace.

**LEMMON & GLENN,**

6m9

62 Buchanan's Wharf, Baltimore.

**Iron.**

**THE SUBSCRIBERS** having resumed the agency of the New-Jersey Iron Company, are prepared to execute orders for the different kinds and sizes of Iron usually made at the works of the company, and offer for sale on advantageous terms.—

150 tons No. 1 Boonton Foundry Pig Iron.  
100 " No. 2 do. do. do.  
300 " Nos. 2 & 3 Forge do. do.  
100 " No. 2 Glendon do. do.  
140 " Nos. 2 & 3 Lehigh Crane do do.  
100 " No. 1 Pompton Charcoal do.  
100 " New-Jersey Blooms  
50 " New-Jersey Faggoting Iron, for shafts  
Best Bars, 1/2 to 4 inch by 1/2 to 1 inch thick.  
Do do Rounds and Squares, 1/2 to 3 inch.  
Rounds and Squares, 3-16 to 1 inch.  
Half Rounds, 1/2 to 1 in. Ovals & Half Ovals 1/2 to 1 1/2 in.  
Bands, 1 1/2 to 4 inch. Hoops, 1/2 to 2 inch.  
Trunk Hoops, 1/2 to 1 1/2 in. Horse Shoe & Nut Iron.  
Nail Plates. Railroad Spikes.

**DUDLEY B. FULLER & Co.,** 139 Greenwich-st. and 85 Broad-st.

**WILLIAM JESSOP & SONS' CELEBRATED CAST-STEEL.**

The subscribers have on hand, and are constantly receiving from their manufactory,

**PARK WORKS, SHEFFIELD,**

Double Refined Cast Steel—square, flat and octagon. Best warranted Cast Steel—square, flat and octagon. Best double and single Shear Steel—warranted. Machinery Steel—round.

Best and 2d gy. Sheet Steel—for saws and other purposes.

German Steel—flat and square, "W. I. & S." "Eagle" and "Goat" stamps.

Genuine "Sykes," L. Blister Steel.

Best English Blister Steel, etc., etc., etc.

All of which are offered for sale on the most favorable terms by **WM. JESSOP & SONS,**

91 John street, New York.

Also by their Agents—

Curtis & Hand, 47 Commerce street, Philadelphia.

Alex'r Fullerton & Co., 119 Milk street, Boston.

Stickney & Beatty, South Charles street, Baltimore.

May 6, 1849.

**JOHNSON, CAMMELL & Co's Celebrated Cast Steel,**

**AND**  
**ENGINEERING AND MACHINE FILES,**  
which for quality and adaptation to mechanical uses, have been proved superior to any in the United States. Every description of square, octagon, flat and round cast steel, sheet, shovel and railway spring steel, best double and single shear steel, German steel, flat and square, goat stamps, etc. Saw and file steel, and steel to order for any purposes, manufactured at their Cyclops Steel Works Sheffield.

**JOHNSON, CAMMELL & CO.,**  
100 William St., New York.

November 23 1849.

**Railroad Iron.**

**OF ANY PATTERN AND WEIGHT,**  
Of a Favorite Brand,

And deliverable in Bond, or Duty paid, at any Port of the U. S., contracted for on favorable terms, by

**CHARLES ILLIUS,**  
20 Beaver St., New York.

Pig and other Iron also contracted for. Sole Agent for "Baxter's Machine and Burning Oil"—particularly adapted for "Railroads" and other Machinery—Preferred to Sperrin by the many now using it, and 25 per cent. cheaper.

**CUT NAILS OF BEST QUALITY, BAR IRON**  
(including Flat Rails) manufactured and for sale by **FISHER, MORGAN & CO.,**  
75 N. Water St., Philadelphia.

**Ogden & Martin's ROSENDALE CEMENT.**

**WE** are prepared to enter into arrangements for supplying our Cement for public works or other purposes. We warrant the cement equal in every respect to any manufactured in this country. It attains a great degree of hardness, sets immediately under water, and is a superior article for masonry coming in contact with water, or requiring great strength.

For sale in tight barrels, well papered, at their office by **OGDEN & MARTIN,** 104 Wall st.

February 16, 1850.

The above cement is used in most of the fortifications building by government.

**To Steam Engine Builders.**

**THE** Underigned offer for sale, at less than half its cost, the following new machinery, calculated for an engine of 62 inches cylinder and 10 feet stroke, viz.

- 2 Wrought Iron Cranks, 60 inches from centre to centre.
- 1 Do. do. Connecting Rod Strap.
- 2 Do. do. Crank Pins.
- 1 Eccentric Strap.
- 1 Diagonal Link with Brasses.
- 1 Cast Iron Lever Beam (forked).

The above machinery was made at the West Point Foundry for the U. S. Steamer Missouri, without regard to expense, is all finished complete for putting together, and has never been used. Drawings of the cranks can be seen on application to

**HENRY THOMPSON & SON,**  
No. 57 South Gay St., Baltimore, Md.

Sept. 12, 1849.

**8,000 Tons Railroad Iron.**

**THE OHIO AND PENNSYLVANIA RAILROAD CO.** wish to contract for eight thousand tons of Railroad Iron, for the eastern division of their road, extending westward from Pittsburgh. Three thousand tons to be delivered on the Ohio river at Pittsburgh and Beaver, before the close of canal navigation in the present year, 1850; and the remainder in the spring of next year. The rails are to be of the H pattern, in lengths of 20 feet, and are to weigh 60 lbs. per lineal yard. They are to be subject to the inspection of Solomon W. Roberts, Chief Engineer.—For further particulars address the President of the Company at Pittsburgh.

By order of the Board of Directors.

**WM. ROBINSON, JR.,** President.

**S. S. Keyser & Co., IRON WAREHOUSE,**

Corner of South and Pratt Streets,  
BALTIMORE, MD.

Selling Agents for the Rough and Ready Bar Iron and Elk Boiler and Flue Iron Rolling Mills, Sarah and Taylor Furnaces, and Wrightsville Hollow Ware Foundry, and Dealers in Bar and Sheet Iron, and Cast, Sheer, German, Blister, Spring and Electrodes Steel, etc., etc.

**Smith & Tyson,**

**GENERAL COMMISSION MERCHANTS,**  
No. 25 South Charles St., Baltimore, Md.

**AGENTS** for the Celebrated Columbia Pig Iron, suitable for Car Wheels and Chilled Rolls.

Columbia refined Charcoal Blooms; Refined Charcoal Junlatta Billet Iron for Wire; Refined Iron for Bridging, of great strength; Cut Nails, Spikes, and Brads; Railroad Spikes and Wrought Chairs. 221

**To Railroad Companies and Contractors.**

**FOR SALE.**—Two Locomotive Engines and Tenders, at present in use on the Beaver Meadow Railroad, being too light for their coal trains, but well calculated for either gravel or light passenger trains.

They weigh, in running order, about 8 tons each—having one pair of driving wheels 4 feet diameter, 4 truck wheels 30 inches diameter, with cylinders 10 in. diameter, and 18 inches stroke of piston. Tenders on 4 wheels. Address **JAMES ROWLAND,**

Pres't. Beaver Meadow Railroad & Coal Co.,

Philadelphia.

or, **L. CHAMBERLAIN, Sec'y,**

at Beaver Meadow, Pa.

May 19, 1849.

**Railroad Instruments.**

**THEODOLITES, TRANSIT COMPASSES,**  
and Levels, with Fraunhoffer's Munich Glasses, Surveyor's Compasses, Chains, Drawing Instruments, Barometers, etc., all of the best quality and workmanship, for sale at unusually low prices, by

**E. & G. W. BLUNT,**

No. 179 Water St., cor. Burling Slip.  
New York, May 19, 1849.

**Rosendale Cement.**

**THE NEWARK AND ROSENDALE LIME AND CEMENT CO.** are now manufacturing at their works in NEWARK, N. J., and Ulster county, N. Y., a very superior article of *Hydraulic Cement*—also Lime Calcine Plaster, etc. Contractors and dealers will find it to their advantage to call or make application before purchasing elsewhere. All communications addressed to the subscriber, at Newark, N. J., will be punctually attended to.

1y\*15

**HENRY WILDE, Secretary.**



## Patent India Rubber Steam Packing.

**T**HIS article, made by the subscriber, who alone is authorised to make it, is warranted to stand as high a degree of heat as any that has been or can be made by any person—and is the article which has made the reputation of India Rubber Steam Packing and the demand therefor. A large assortment of all thick nesses requisite for any description of engines, steam pipes, valves, etc., constantly on hand and for sale by the manufacturer and patentee, who will give every information regarding its properties, mode of use, etc. at the warehouse.

JOHN GREACHEN, JR.,  
98 Broadway, opposite Trinity Church.  
New York, October, 1849.

## Passenger Car Linings.

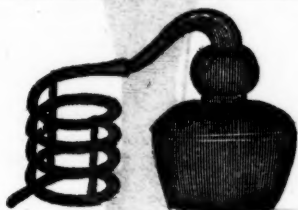
**T**HE Advertiser continues to make to order the Enamelled Car Linings which have been so highly approved the last three years, and are now exclusively used by all the Northern Railroads. No pains are spared to get out new styles, and adapt them to the tastes of every consumer.

Orders addressed to CHARLES STODDER, No. 75 Kilby street, Boston, will have prompt attention.  
March 23, 1850. 2m

## CAUTION.

**R**AILROAD COMPANIES and others are here-by cautioned against using or vending our improvement for easing the lateral motion as applied on Railroad Cars. Letters Patent have been granted to us in 1841, any party or parties so making or using said improvement without license from us will be proceeded against according to law.

DAVENPORT & BRIDGES.



## P. H. Griffin,

Corner of Steuben and James Sts. Albany, N.Y.,  
**C**ONTINUES to manufacture copper flues for locomotive boilers, brewers' coppers, stills, tanner heaters, etc. Copper work in general, at the shortest notice. He has constantly on hand brass cocks, brass valves, copper pumps of every variety.

Orders promptly attended to. 1y14

## FOWLER M. RAY'S Patent India-rubber Railroad CAR SPRING.

New York and Erie Railroad Shops.  
Piermont, March 26, 1850.

This will certify that from practical experience in the use of Fowler M. Ray's India rubber Car Springs, I believe them to be far superior to any others now in use.

I have never known them to be affected by any change of temperature, as other Rubber Springs have been affected on this road.

I am at the present time repairing a Passenger Car that Mr. Ray and myself mounted with his springs about two years and eight months since.

The springs are at the present time as perfect, to all appearances, as when first applied to the car.

Respectfully yours,

HORACE B. GARDNER,  
Foreman of the Car Shops.

Supt. Office N.Y. & H. R.R.,  
New York, March 8, 1850.

This is to certify that we have used the Rubber Springs manufactured by Mr. F. M. Ray for the past twenty months, "both for Passenger and Freight Car Springs and Bumpers, and of different sizes," and have in every case given entire satisfaction, and I consider them the best spring now in use.

M. SLOAT, Supt.

Harlem R.R. Depot,  
New York, March 7, 1850.

This is to certify that we have used Mr. F. M. Ray's India-rubber Springs for over eighteen months, and find them to be easy and durable, and recommend them to railroad companies as being superior to anything we have tried.

J. M. SMART,  
Foreman at 42d St. Depot.

Office New Jersey Railroad Co.,  
Jersey City, March 8, 1850.

FOWLER M. RAY, Esq.,

Dear Sir: In answer to your enquiries respecting the operation of the Vulcanised Rubber Springs, purchased by our company from you some two years since, I reply that they are superior to any spring in use, (that I have either seen or heard of).

The improved form of your spring, consisting of a solid piece of vulcanised rubber with bands on the outside, is far superior to your first form, consisting of disks of rubber with metallic plates interposed.

The last named form was tried, if you recollect, at a much earlier period; and then was replaced by your last form.

I have no hesitation in saying that your springs have given entire satisfaction, and most cheerfully recommend them to railroad companies throughout the country for the following reasons:

- 1st. The cost is 30 per cent. less.
- 2d. Saving of weight on each car of 8 wheels from 700 to 800 lbs.
- 3d. Less care and attention is required, as they are not liable to get out of repair.
- 4th. A great saving is secured in the wear and tear of the cars and rails from their great elasticity.
- 5th. The freedom from noise.
- 6th. There is greater safety in case of accident, as they cannot be broken.
- 7th. The comfort of passengers is enhanced sufficiently to pay the expense, waiving all the other reasons that I have given.

Should this fail to satisfy any person enquiring, you are at liberty to refer to me, No. 150 Washington St., Jersey City.

Yours respectfully,  
T. L. SMITH, Supt.

New York, March 11, 1850.

I have used the Patent India-rubber Spring purchased of Mr. Ray, upon the cars of the New York and New Haven Railroad, and have found them efficient and economical; and when applied to the axles and draw springs, believe them to be quite equal to any in use. I have found a combination of these springs with a steel spring under the transom beam a very satisfactory arrangement, and am now using this plan in all new cars.

Yours respectfully,  
ROBERT SCHUYLER.

February 25, 1850.

From practical observation of the use of the India-rubber Car Springs, manufactured and sold by your company, we are entirely satisfied in their application, and do not hesitate to recommend them as elastic, durable, requiring no repairs for years, and retaining their consistency during all extremes of weather. We have applied them for the past two years, and consider them superior for all railroad purposes.

Yours truly,  
OSGOOD BRADLEY, Car Builder, Worcester.  
T. & C. WASON, do. Springfield.  
DEAN, PACKARD & MILLS, do. do.  
DAVENPORT & BRIDGES, do. Cambridgeport.

Office of the New Jersey Railroad Co.,  
Jersey City, March 7, 1850.

This is to certify that we have had Mr. F. M. Ray's India-rubber Springs in constant use under our cars, and as Bumper Springs for upwards of two years, and they have in every way given perfect satisfaction.

The present form of spring we deem far superior to the form of Disk, having used both forms, although we have none of those made in Disks at present in use.

We take pleasure in recommending these springs to all railroad companies.

J. P. JACKSON, Vice-Prest.  
New Jersey Railroad and Trans. Co.

Roxbury, February 23, 1850.

In compliance with your request, I take great pleasure in stating the result of my experience in the use of "Ray's Patented Vulcanised India-rubber Car and Engine Springs." We have used them nearly two years, and never had one fail in any way. The cold weather does not affect them, as it has other rubber springs we have used.

With sixteen years' experience as superintendent of machinery on the Boston and Providence railroad, I take pleasure in saying that your springs are the best we ever used, or I ever saw used elsewhere. We have 20 cars rigged with them, of which I can say that the springs are as good now as when first applied. I put 24 lbs. of the rubber under the forward end of one of our heaviest engines, taking off 250 lbs. of steel springs—it has been in use 18 months, and is in as good condition now as when first put under the engine.

Very respectfully yours,

GEO. S. GRIGGS,  
Supt. of Machinery, Boston and Prov. R.R.

Fall River, February 2, 1850.

In answer to yours of the 20th ult. I would say that this company has for some 10 or 12 months past been using "Ray's India-rubber Springs." We have applied them to both passenger and freight cars, with uniform success. They have invariably preserved their elasticity and consistency through all the extremes of weather; and we are now applying them whenever the steel spring fails. I am well satisfied that they are particularly adapted for railroad purposes.

Very respectfully yours,

GEO. HAVEN,  
Supt. Fall River Railroad.

Jersey City, March 9, 1850.

This is to certify that the present form of Mr. F. M. Ray's India-rubber Car Spring I consider far superior to the form of Disk, having used both forms. I take pleasure in recommending these springs to all railroad companies.

DAVID H. BAKER,  
Foreman of Car Shop of N.J. R.R. & Trans. Co.

Boston, March 5, 1850.

In answer to your enquiry about India-rubber Springs, I have to say that we have used them to a considerable extent on both freight and passenger cars, and also on several of our tenders; and I am very well satisfied that they answer all the purposes for which they are intended. I believe the India-rubber will soon supersede all other springs for cars and tenders.

Yours truly,  
S. M. FELTON,  
Supt. Fitchburg Railroad.

Old Colony Railroad Office,  
Boston, March 6, 1850.

EDWARD CRANE, Esq.,

President New England Car Co.,

Dear Sir: In compliance with your request I would state that the Old Colony Railroad Comp'y have had in use upon their road, India-rubber Springs furnished by your company, for more than eighteen months past, during which time they have been extensively used under Passenger and Freight Cars, Locomotive Tenders, and for Drawer and Buffering Springs, with the most perfect success. The elasticity and consistency of the Rubber has never been unfavorably affected by either extremes of heat or cold—and from the experience which we have had in the use of Rubber Springs, I think them well adapted for railroad purposes—and therefore we have for some months past used Rubber almost exclusively, in all places where springs are required.

Respectfully yours, etc.,

JAS. H. MOORE,  
Supt. O. C. Road.

Troy, February 27, 1850.

We have been using your India-rubber Car Springs for nearly two years—and we take pleasure in saying that in our opinion the rubber has to a certain extent already, and may eventually entirely supersede all other Springs for Railroad Car purposes. We now use it entirely for Draw Springs and Bumpers, considering it better and lighter than steel.

During our two years' experience in the use of it, we have not known any to lose their elasticity, or fail in any way; and we cheerfully recommend the rubber for railroad car springs.

Very respectfully,  
EATON, GILBERT & CO.

## To Practical Machinists.

**A**N excellent opportunity now occurs to a practical Machinist, of well established REPUTATION, and some capital, to engage extensively in the STEAM ENGINE, BOILER and FOUNDRY BUSINESS.

An establishment is now ready for business, ample in all its details, including extensive wharf room, for any sized steamboats, and from its position, if properly conducted, will doubtless command a large share of business.

A practical Machinist, as a partner is required, to conduct the whole establishment: and only those FULLY COMPETENT need apply. Address (post paid) "MACHINE CO.," Box No. 741, Philadelphia, Pa. 1ml4

## Etna Safety Fuse.

**T**HIS superior article for igniting the charge in wet or dry blasting, made with DUPONT'S best powder, is kept for sale at the office and depot of

REYNOLDS & BROTHER,

Sole Manufacturers, 41

No. 85 Liberty St.

NEW YORK.

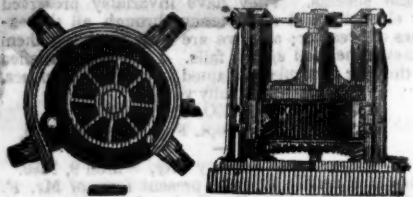
And in the principal cities and towns in the U. States. The Premium of the AMERICAN INSTITUTE was awarded to the Etna Safety Fuse at the late Fair held in this city.

November 3, 1849.

ly

## MACHINERY.

## Henry Burden's Patent Revolving Shingling Machine.



THE Subscriber having recently purchased the right of this machine for the United States, now offers to make transfers of the right to run said machine, or sell to those who may be desirous to purchase the right for one or more of the States.

This machine is now in successful operation in ten or twelve iron works in and about the vicinity of Pittsburgh, also at Phoenixville and Reading, Pa., Covington Iron Works, Md., Troy Rolling Mills, and Troy Iron and Nail Factory, Troy, N. Y., where it has given universal satisfaction.

Its advantages over the ordinary Forge Hammer are numerous: considerable saving in first cost; saving in power; the entire saving of shingler's, or hammerman's wages, as no attendance whatever is necessary, it being entirely self-acting; saving in time from the quantity of work done, as one machine is capable of working the iron from sixty puddling furnaces; saving of waste, as nothing but the scoria is thrown off, and that most effectually; saving of staffs, as none are used or required. The time required to furnish a bloom being only about six seconds, the scoria has no time to set, consequently is got rid of much easier than when allowed to congeal as under the hammer. The iron being discharged from the machine so hot, rolls better and is much easier on the rollers and machinery. The bars roll sounder, and are much better finished. The subscriber feels confident that persons who will examine for themselves the machinery in operation, will find it possesses more advantages than have been enumerated. For further particulars address the subscriber at Troy, N. Y.

P. A. BURDEN.

## Railroad Spikes and Wrought Iron Fastenings.

THE TROY IRON AND NAIL FACTORY, exclusive owner of all Henry Burden's Patented Machinery for making Spikes, have facilities for manufacturing large quantities upon short notice, and of a quality unsurpassed.

Wrought Iron Chairs, Clamps, Keys and Bolts for Railroad fastenings, also made to order. A full assortment of Ship and Boat Spikes always on hand.

All orders addressed to the Agent at the Factory will receive immediate attention.

P. A. BURDEN, Agent,  
Troy Iron and Nail Factory, Troy, N. Y.

## RAILROAD WHEELS.

**CHILLED RAILROAD WHEELS.**—THE UNDERSIGNED are now prepared to manufacture their Improved Corrugated Car Wheels, or Wheels with any form of spokes or discs, by a new process which prevents all strain on the metal, such as is produced in all other chilled wheels, by the manner of casting and cooling. By this new method of manufacture, the hubs of all kinds of wheels may be made whole—that is, without dividing them into sections—thus rendering the expense of banding unnecessary; and the wheels subjected to this process will be much stronger than those of the same size and weight, when made in the ordinary way.

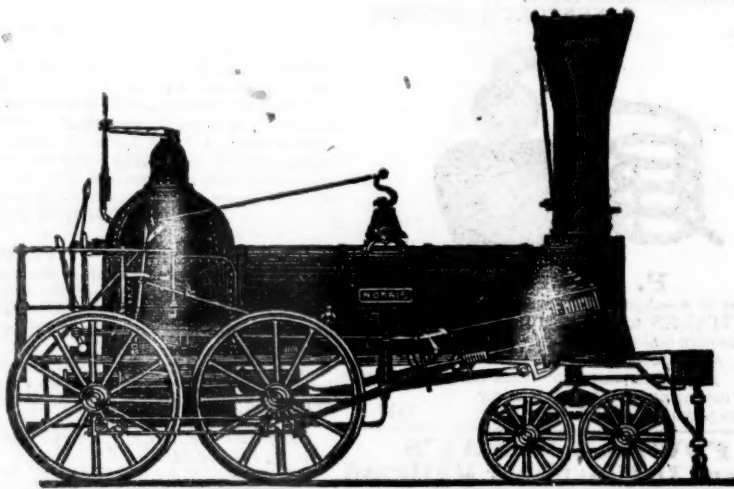
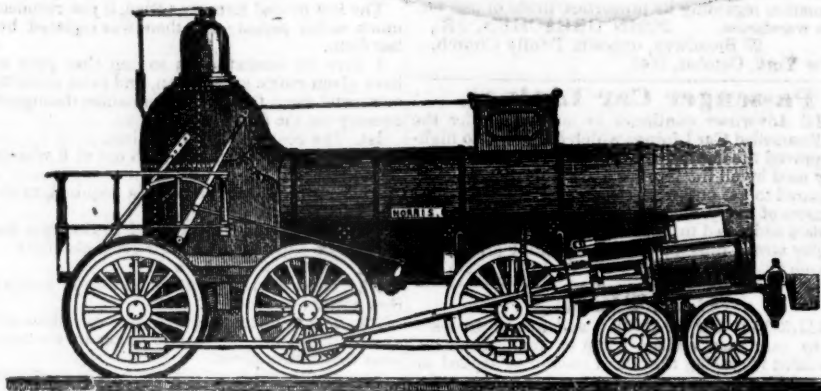
A. WHITNEY & SON,  
Willow St., below 13th,  
Philadelphia, Pa.

**CHILLED RAILROAD WHEELS.**—THE UNDERSIGNED, the Original Inventor of the Plate Wheel with solid hub, is prepared to execute all orders for the same, promptly and faithfully, and solicits a share of the patronage for those kind of wheels which are now so much preferred, and which he originally produced after a large expenditure of time and money.

A. TIERS,  
Point Pleasant Foundry.

He also offers to furnish Rolling Mill Castings, and other Mill Gearing, with promptness, having, he believes, the largest stock of such patterns to be found in the country.

A. T.  
Kensington, Philadelphia Co.,  
March 12, 1848.

NORRIS' LOCOMOTIVE WORKS.  
BUSHHILL, SCHUYLKILL SIXTH-ST., PHILADELPHIA,

THE UNDERSIGNED Manufacture to order Locomotive Steam Engines of any plan or size. Their shops being enlarged, and their arrangements considerably extended to facilitate the speedy execution of work in this branch, they can offer to Railway Companies unusual advantages for prompt delivery of Machinery of superior workmanship and finish.

Connected with the Locomotive business, they are also prepared to furnish, at short notice, Chilled Wheels for Cars of superior quality.

Wrought Iron Tyres made of any required size—the exact diameter of the Wheel Centre, being given, the Tyres are made to fit on same without the necessity of turning out inside.

Iron and Brass castings, Axles, etc., fitted up complete with Trucks or otherwise.

NORRIS, BROTHERS

**LAWRENCE'S ROSENDALE HYDRAULIC Cement.** This Cement is warranted equal to any manufactured in this country, and has been pronounced superior to Francis' "Roman." Its value for Aqueducts, Locks, Bridges, Floods, and all Masonry exposed to dampness, is well known, as it sets immediately under water, and increases in solidity for years.

For sale in lots to suit purchasers, in tight papered barrels, by  
JOHN W. LAWRENCE,  
142 Front-street, New York.

Orders for the above will be received and promptly attended to at this office.

32 ly.

## PATENT MACHINE MADE HORSE-SHOES.

The Troy Iron and Nail Factory have always on hand a general assortment of Horse Shoes, made from Refined American Iron.

Four sizes being made, it will be well for those ordering to remember that the size of the shoe increases as the numbers—No. 1 being the smallest.

P. A. BURDEN, Agent,  
Troy Iron and Nail Factory, Troy, N. Y.

COLUMBUS, OHIO,  
Railroad Car Manufactory.  
RIDGWAYS & KIMBALL,

HAVE established at this central point, the manufacture of Passenger, Freight, Gravel and Hand Cars for Railroads, and assure all Western Railroad Companies that it will be their constant aim to procure the best materials and workmen, and to turn out the best kind of work at fair prices. Specimens may be seen on the Columbus and Xenia Railroad. The patronage of Railroad Companies is respectfully solicited.

1y8

## To Inventors and Patentees.

OWEN G. WARREN, ARCHITECT, Has had many years' experience as Agent for obtaining Patents, both in this country and Europe, and will transact such business promptly and reasonably. Persons at a distance can have their business done by correspondence—without the necessity of visiting this city or Washington. Office No. 94 Merchants Exchange, Wall st., corner of Hanover st., up stairs.

1y3



Mr. HALL:—"The New England Car Co., having been engaged for the last six months in introducing the Vulcanized India-rubber Car Springs upon the different railroads in this and other states, and having in particular introduced it upon the Boston and Worcester railroad with perfect success, were much gratified to find, by your paper of this morning, that the article had given satisfaction to the president of that corporation, and the terms of just commendation in which you were pleased to speak of it. But their gratification was scarcely equalled by their surprise, when, or arriving at the close of your paragraph, they found the results of all their labors attributed to a foreign source, with which the New England Car Co. has no connection. The material used on the Boston and Worcester railroad, and all the other railroads in this country, where any preparation of India-rubber has been successfully applied, is entirely an American invention, patented in the year 1844 to Charles Good-year, of New Haven, Conn., and the application of it to this purpose and the form in which it is applied are the invention of F. M. Ray of New York. The only material now in use, and so far as has yet appeared, the only preparation of India rubber capable of answering the purpose, has been furnished under these patents by the New England Car Company, manufactured under the immediate inspection of their own agent. If any other should be produced, the right to use it would depend upon the question of its interference with Mr. Goodyear's patent. The New England Car Company have their place of business in this city at No. 99 State street, and are prepared to answer all orders for the Vulcanized India rubber Car Springs, of the same quality and of the same manufacture as those which they have already placed on your road, and most for the other roads terminating in this city."

And yet Mr. Knevit is using these experiments made upon the Springs of the Car Company to induce the public to purchase his springs, and is attempting to impose upon them the belief that the springs used were furnished by him! We ask whether such a course is honorable, or entitles his statements to much consideration from the public.

The above Springs are for sale 98 Broadway, New York, and 99 State street, Boston.

EDWARD CRANE Agent, Boston.  
F. M. RAY, Agent, New York.  
Boston, May 8, 1849.

## Ballard's Improved JACK-SCREW.

PATENTED.

THE ADVANTAGES OF THIS Screw for Stone Quarries, Railroads, Steam Boiler Builders, and for other purposes are superior to any other similar machine.

The improvement consists in being able to use either end of the screw, as occasion requires.

It is capable of raising the heaviest Locomotive with ease, being portable, strong and powerful, and not likely to get out of order.

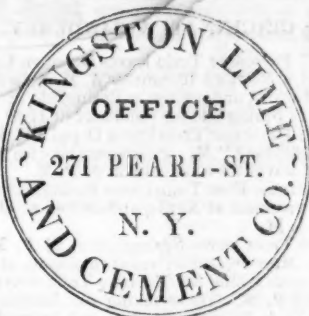
Many Railroad Companies and Boiler Makers have them in use—by whom they are highly recommended.

JACK SCREWS, of various sizes, power and price, constantly on hand at the manufactory.

No. 7 Eldridge Street, near Division Street.  
New York, Jan. 19, 1850.



## Hydraulic Cement.



HYDRAULIC CEMENT, OF BEST QUALITY, manufactured at their works, for sale in lots to suit purchasers.

Also, Ground Lime, a superior article for Builders.  
ISAAC FRYER, Sec'y.  
January 19, 1850.

## Engine and Car Works, PORTLAND, MAINE.

THE PORTLAND COMPANY, Incorporated August 8th, 1846, with a capital of \$250,000, have erected their extensive Works upon the deep water of Portland Harbor, and receive and transport, to and from their works direct, to and from vessels of any class.

They now manufacture to order, and deliver upon the Railroads running in each direction from the city, or on shipboard as wanted, Locomotive, Stationary, or Steam Boat Engines; Passenger, Mail, Freight, Earth and Hand Cars; Railway Frogs, Switches, Chairs and Castings; and every other description of Machinery.

HORACE FELTON, Superintendent.

JAMES C. CHURCHILL, General Agent and Clerk.

## RAILROADS.

### EASTERN RAILROAD.

#### WINTER ARRANGEMENT.

On and after Monday, October 8, 1849, trains leave

Boston daily (Sundays excepted);

For Lynn, 7, 8, 10 a.m., 12, 2, 4, 4, 6, p.m.

Salem, 7, 8, 10 a.m., 12, 2, 4, 4, 6, p.m.

Manchester and Gloucester, 10 a.m., 4 p.m.

Newburyport, 7, a.m., 12, 2, 4, p.m.

Portsmouth, 7, a.m., 2, 4, p.m.

Portland, Me., 7, a.m., 2, p.m.

And for Boston,

From Portland, 8, a.m., 4 p.m.

Portsmouth, 7, 10, a.m., 6, p.m.

Newburyport, 7, 11, a.m., 3, 7, p.m.

Gloucester, 7, a.m., 1, p.m.

Manchester, 8 a.m., 2 p.m.

Lynn, 7, 8, 9, 10, a.m., 12, 5, 2, 4, p.m.

Salem, 7, 8, 9, 10, a.m., 12, 4, 2, 4, p.m.

8, p.m.

\* Or on their arrival from the East.

Freight trains each way daily. Office 17 Merchants' Row, Boston.

Feb. 3. JOHN KINSMAN, Superintendent.

### ALBANY AND BUFFALO RAILROADS.

Four Trains daily, Sundays excepted, viz:

Leave Albany, 6 a.m., 9 a.m., 2 p.m., 7 p.m.

Reach Buffalo, 15 hours, 18 hours, 23 hours, 18 hours.

Arrive from Buffalo, 7 p.m., 2, a.m., 12, m., 3, p.m.

Passengers by the Express Train reach Buffalo

from New York, and New York from Buffalo, in 24

hours. The Isaac Newton and Oregon connect at

Albany with this Train. Baggage cars, with careful

baggage masters, run through with all the trains.

For Schenectady, Saratoga Springs & Whitehall,

Leave Albany at 7 a.m. and 2 p.m. For Schenectady

only at 6, 7 and 9 a.m. and 12, 2 and 7 p.m. For

Erie Canal packets at 7 a.m. and 7 p.m. By Plank

Road from Schenectady to Saratoga at all hours by

stages, etc.

The Eastern Trains leave Albany at 7 a.m. and 3

p.m. The wagons of the company take baggage free

between railroads and steamboats at Albany.

E. FOSTER, Jr., Sec'y

Albany and Schenectady Railroad Co.

Albany, August, 1849.

## BOSTON AND MAINE RAILROAD.

### Winter Arrangement, 1850.

Outward Trains from Boston

For Portland at 7 a.m. and 2, p.m.

For Rochester at 7 a.m., 2, p.m.

For Great Falls at 7 a.m., 2, 3, p.m.

For Haverhill at 7 and 9, a.m., 2, 3, 5, p.m.

For Lawrence 7, 7, 9, a.m., 12, 2, 3, 4, 5, p.m.

For Reading 7, 9, a.m., 12, 2, 3, 4, 5, 7, 9, p.m.

For Medford 7, 9, a.m., 12, 2, 5, 6, 9, p.m.

The Station in Boston is on Haymarket Square.

CHAS. MINOT, Super't.

January 10, 1850.

### NEW YORK AND HARLEM RAILROAD. NEW ARRANGEMENT.

On and after Wednesday, October

17th, 1849, the Cars will run as follows, (Sundays excepted) until further notice:

Trains will leave the City Hall, New York, for—

Harlem and Morrisania at 6, 8, 10, 11, 12 a.m., 2, 3, 4, 5, 6, p.m.

New Village, at 8, 10, 12 a.m., 3, 5, 6, p.m.

Fordham and Williams' Bridge, at 8, 10, 12 a.m., 2, 3, 5, 6, p.m.

Hunt's Bridge, Underhill's and Hart's Corners, at 8, 10 a.m., 3, 5 p.m.

Tuckahoe and White Plains, at 8, 10 a.m., 2, 3, 5 p.m.

Pleasantville, New Castle, Bedford, Mechanicsville, Purdy's, Croton Falls, and intermediate stations, on signal, 8, a.m., 2, 3, p.m.

Brewster's, Towner's, Patterson, Paulding's, South Dover, Dover Furnace, and Dover Plains, 8, a.m., 2, p.m.

NOTICE—Passengers are reminded of the great danger of standing upon the platform of the cars, and hereby notified that the practice is contrary to the rules of the Company, and that they do not admit any responsibility for injury sustained by any passenger upon the platforms, in case of accident.

Returning to New York will leave

Harlem and Morrisania at 6 08, 7, 8 37, 9, 10 6, 12 a.m., 1 43, 3 07, 3, 5, 5 47 p.m.

New Village, at 5 58, 8 27, 9 56 a.m., 1 33, 2 57, 5 36 p.m.

Fordham and William's Bridge at 5, 8 14, 9 43, 10 57 a.m., 1 20, 2 44, 5 24 p.m.

Hunt's Bridge at 8 04, 9 33 a.m., 2 34, 5 16 p.m. On signal.

Underhill's, at 7 56, 9 23 a.m., 2 26, 5 10 p.m. On signal.

Tuckahoe at 7 53, 9 18, 10 40 a.m., 2 23, 5 08 p.m.

Hart's Corners at 7 38, 9 03 a.m., 2 08, 4 54 p.m.—On signal.

White Plains at 7, 8 55, 10 20 a.m., 2, 4 47 p.m.

Davis' Brook at 8 40, 10 11 a.m., On signal. 4 39 p.m. On signal.

Unionville, 8 27, 10 11 a.m. On signal. 4 29 p.m.—On signal.

Pleasantville at 8 20, 9 56 a.m., 4 24 p.m.

Chappaqua, at 8 10, 9 50 a.m. On signal. 4 18 p.m. On signal.

New Castle, at 7 56, 9 38 a.m., 4 07 p.m.

Bedford at 7 46, 9 32 a.m., 4 02 p.m.

Mechanicsville at 7 36, 9 22 a.m., 3 52 p.m.

Golden's Bridge, 7 28, 9 17 a.m. On signal, 3 47 p.m. On signal.

Purdy's at 7 20, 9 09 a.m., 3 39 p.m.

Croton Falls, at 7, 9 04 a.m., 3 34 p.m.

Brewster's, at 8 50 a.m., 3 20 p.m.

Towner's, at 8 35 a.m., 3 05 p.m.

Patterson, at 8 27 a.m., 2 57 p.m.

Paulding's, at 8 17 a.m., 2 47 p.m.

South Dover, 8 02 a.m., 2 32 p.m.

Dover Furnace, 7 55 a.m., 2 25 p.m.

Dover Plains, at 7 45 a.m., 2 15 p.m.

The trains for Harlem and Morrisania leaving City Hall at 6, 8, 10, 11, 12, 2, 4 and 6, returning from Morrisania and Harlem at 6 08, 7, 9, 12, 1 43, 3 07, 3, 5 o'clock, will land and receive passengers at 27th 42d, 51st, 61st, 79th, 86th, 109th, 115th, 125th and 132d streets.

The Dover Plains train from New York at 2, p.m., returning leaving Dover Plains at 7, a.m., will not stop between White Plains and New York, (except at Tuckahoe, Williams' Bridge and Fordham), unless to leave passengers coming from above Croton Falls.

A car will precede each train ten minutes to take up passengers in the city. The last car will not stop, except at Broome st. and 27th street.

Freight Trains leave New York at 1 o'clock p.m.—Returning, leaves Dover Plains at 12 o'clock m.

For Sunday Arrangements, see hand bills.

M. SLOAT, Sup't.

NICOLL'S PATENT SAFETY SWITCH FOR Railroad Turnouts. This invention for some time in successful operation on one of the principal railroads in the country, effectually prevents engines and their trains from running off the track at a switch, left wrong by accident or design. It acts independently of the main track rails; being laid down or removed without cutting or displacing them.

It is never touched by passing trains, except when in use, preventing their running off the track. It is simple in its construction and operation, requiring only two castings and two rails; the latter, even if much worn or used, not objectionable.

Working models of the Safety Switch may be seen at Messrs. Davenport, Bridges & Kirk's Cambridge Port, Mass., and at the office of the Railroad Journal, New York.

Plans, Specifications, and all information obtained, on application to the Subscriber, Inventor and Patentee.

G. A. NICOLLS, Reading, Pa.

NEW YORK AND ERIE RAILROAD.  
CHANGE OF HOURS.

On and after Monday, May 6, 1850, the trains will leave as follows, by steamboat THOMAS POWELL, from the foot of Duane st. daily (Sundays excepted).  
Breakfast and supper on board the boat.

WAY AND MAIL TRAIN—At 6½ a.m., stopping at all the stations—arriving at Corning and Jefferson about 10½ p.m., and at Buffalo next morning.

NIGHT TRAIN—at 5 p.m., stopping at all the stations and arriving at Geneva in time to connect with the Express train from Albany, and arrive at Buffalo at 7 p.m., next day.

AN EXPRESS TRAIN—Will commence running in a few days, of which due notice will be given.

FREIGHT TRAIN—Leave New York, from foot of Duane st. daily, (Sundays excepted) at 5 p.m. Freight for Geneva, Rochester and Buffalo, forwarded by Express freight train. CHAS. MINOT, Supt.

New York, May 2, 1850.

GEORGIA RAILROAD. FROM AUGUSTA TO ATLANTA—171 MILES.

AND WESTERN AND ATLANTIC RAILROAD, FROM ATLANTA TO DALTON, 100 MILES.

This Road, in connection with the South Carolina Railroad, and Western and Atlantic Railroad, now forms a continuous line, 408 miles in length, from Charleston to Dalton (Cross Plains) in Murray county, Ga. 32 miles from Chattanooga, Tenn.

RATES OF FREIGHT.

	Between Augusta and Dalton.	Between Charleston and Dalton.
	271 miles.	408 miles.
1st class Boxes of Hats, Bonnets, and Furniture, per cubic foot	\$0 18	\$0 28
2d class Boxes and Bales of Dry Goods, Saddlery, Glass, Paints, Drugs, and Confectionary, per 100 lbs.	1 00	1 50
3d class Sugar, Coffee, Liquor, Bagging, Rope, Cotton, Yarns, Tobacco, Leather, Hides, Copper, Tin, Feathers, Sheet Iron, Hollow ware, Castings, Crockery, etc.	0 60	0 85
4th class Flour, Rice, Bacon, Pork, Beef, Fish, Lard, Tallow, Beeswax, Bar Iron, Ginseng, Mill Gearing, Pig Iron, and Grindstones, etc.	0 40	0 65
Cotton, per 100 lbs.	0 45	0 70
Molasses per hogshead	8 50	13 50
" " barrel	2 50	4 25
Salt per bushel	0 18	
Salt per Liverpool sack	0 65	
Ploughs, Corn Shellers, Cultivators, Straw Cutters, Wheelbarrows	0 75	1 50

German or other emigrants, in lots of 20 or more, will be carried over the above roads at 2 cents per mile.

Goods consigned to S. C. Railroad Company will be forwarded free of commissions. Freight payable at Dalton.

F. C. ARMS, Sup't of Transportation.

To Miners and Mining Companies.

THE undersigned would respectfully call the attention of those persons engaged in mineral operations on Lake Superior to the following list of articles which will be sold on accommodating terms, viz:

- 600 bbls. Corn fed No. 1 Mess Pork.
- 500 " Stall fed Mess Beef.
- 25,000 lbs. " Sugar cured canvassed" Hams.
- 2,200 " Dried Beef.
- 60,000 " " Kiln dried" Corn Meal.
- 500 bush. White " Field" Beans.
- 300 " Canada" Peas.
- 500 " Dried Apples.
- 100 bbls. and half bbls. "cucumber" Pickles.
- 50 " Sour Krout.
- 30 bush. Onions.
- 1,000 Beefs' Tongues Smoked and in Pickle.
- 10,000 lbs. " Mould" Candles.
- 10,000 " "Hard" Soap.

Also, a full and large supply of all articles that may be required by Mining Companies and those connected with them.

C. A. TROWBRIDGE, 127 Jefferson Avenue, Detroit, Michigan.

LITTLE MIAMI RAILROAD.—SUMMER ARRANGEMENT.

CINCINNATI & SANDUSKY.

FIRST Passenger Train leaves Depot on East Front street, at 5 o'clock 10 minutes A. M. stops for breakfast at Morrow, and arrives at Springfield at 11 10 A. M. Leaves Springfield for Sandusky at 11 50 A. M.

Second Passenger Train leaves Depot 3 P. M. arrives at Springfield at 9 P. M. Passengers take tea at Springfield, and leaves for Sandusky at 9½ P. M.

RETURNING—First Train leaves Springfield at 4 A. M. Stop for breakfast at Xenia, and arrives at Cincinnati at 10 15 A. M.

Second Train leaves Springfield at 2½ P. M. Stop for tea at Morrow, and arrives at Cincinnati, at 8½ P. M.

Passengers taking the Morning Train arrive at Sandusky at 9 P. M. Those taking the Afternoon Train arrive at 7½ A. M. next morning, and proceed directly on in the boats.

Passengers for Columbus, Zanesville, Wheeling, and intermediate towns, should take the 5, 10 A. M. Train. The Ohio Stage Company are running the following Lines in connection with the Trains:

A Daily Daylight Line to Columbus from Springfield in connection with the Morning Train from Cincinnati. Also, Daily Lines to Columbus, from Xenia and Springfield, connecting with the 3 o'clock, pm. Train from Cincinnati.

Fare from Cincinnati to Xenia	\$1 90
Do do Springfield	2 50
Do do Sandusky City	6 50
Do do Buffalo	10 00
Do do Columbus	4 50

For other information and through tickets, apply at the Ticket Office on Broadway, near Front-st., Cincinnati.

W. H. CLEMENT, Superintendent.

The Company will not be responsible for Baggage exceeding 50 dollars in value, unless the same is returned to the Conductors or Agent, and freight paid at the rate of a passage for every 500 dollars in value above that amount.

PHILADELPHIA, WILMINGTON, & BALTIMORE RAILROAD.

Summer Arrangement. April 1st, 1849.—Fare \$3.

Leave Philadelphia 8½ am., and 10 pm. Leave Baltimore 9 am., and 8 pm.

Sunday—Leave Philadelphia at 10 pm. " Baltimore at 8 pm.

Trains stop at way stations.

Charleston, S. C. Through tickets Philadelphia to Charleston, \$20. Pittsburg and Wheeling.

Through ticket, Philadelphia to Pittsburg, \$12. " Wheeling, 13.

Through tickets sold at Philadelphia office only. Wilmington Accommodation.

Leave Philadelphia at 12 m. 4 and 7 pm. Leave Wilmington at 7½ am., 4½ and 7 pm.

Newcastle Line. Leave Philadelphia at 2½ pm.—Baltimore at 1½ pm.

Fare \$3.—Second class, \$2. N.B.—Extra baggage charged for.

I. R. TRIMBLE, Gen. Supt.

BALTIMORE AND SUSQUEHANNA RAILROAD.—Reduction of Fare. Morning and Afternoon Trains between Baltimore and York.—The Passenger Trains

run daily, except Sundays, as follows:

Leave Baltimore at	9 am. and 3½ pm.
Arrive at	9 am. and 6½ pm.
Leave York at	5 am. and 3 pm.
Arrive at	12½ pm. & 8 pm.
Leave York for Columbia at	1½ pm. & 8 am.
Leave Columbia for York at	8 am. & 2 pm.

Fare to York

" Wrightsville	\$1 50
" Columbia	2 00

Way points in proportion.

PITTSBURG, GETTYSBURG, AND HARRISBURG.

Through tickets to Pittsburg via stage to Harrisburg

Or via Lancaster by railroad	10
Through tickets to Harrisburg or Gettysburg	3

In connection with the afternoon train at 3½ o'clock, a horse car is run to Green Spring and Owning's Mill, arriving at the Mills at

Returning, leaves Owning's Mills at	7 am.
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D. C. H. BORDLEY, Sup't. Ticket Office, 63 North st.

PHILADELPHIA & READING RAILROAD. Passenger Train Arrangement for 1848.

A Passenger Train will leave Philadelphia and Pottsville daily, except Sundays, at 9 o'clock am.

The Train from Philadelphia arrives at Reading at 12 18 m.

The Train from Pottsville arrives at Reading at 10 43 am.

Fares.	Miles.	No. 1.	No. 2.
Between Phila. and Pottsville,	92	\$3.50	and \$3.00
" " Reading	58	2.25	and 1.90
" " Pottsville	34	1.40	and 1.20

Five minutes allowed at Reading, and three at other way stations.

Passenger Depot in Philadelphia corner of Broad and Vine streets.

BALTIMORE AND OHIO RAILROAD AND WASHINGTON BRANCH.

On and after January 1, 1850, Passenger Trains will run as follows:

Leave Baltimore for Ellicott's Mills, Frederick, Harper's Ferry, Martinsburg, Hancock and Cumberland, every morning at 7½ o'clock. This line carries the Great Mail, and connects with Post Coaches at Cumberland, for Wheeling and Pittsburg, over the National Road. Also with the Winchester Trains, at Harper's Ferry. N.B.—Passengers for Pittsburg take the steamers of the Monongahela slack water navigation at Brownsville, only 76 miles from Cumberland.

Leave Baltimore for Ellicott's Mills, Frederick and Harper's Ferry, daily, except Sunday, at 4½ p.m.

Leave Baltimore for Washington City, daily, at 6 a.m. and 5 p.m.—daily, except Sunday, at 9 a.m. The early train connects with the Great Southern Line, via Frederickburg and Richmond, to Charleston.

Leave Cumberland for Baltimore, etc.—at 8½ a.m., daily, connecting with the train from Winchester at Harper's Ferry—with the Evening Train to Washington City, at the Relay House—and with the Evening Train to Philadelphia, at Baltimore. Time for arriving at Baltimore, 5½ p.m.

Leave Harper's Ferry for Baltimore, daily, except Sunday, at 7½ a.m.—taking in Passengers who leave Frederick at 8½ a.m.

Leave Washington for Baltimore, daily, at 6 a.m. & 5½ p.m., and daily, except Sunday, at 9½ a.m. The early train connects at the Relay House with the morning line to Cumberland and the West, and at Baltimore with the day line to Philadelphia and New York.

Through tickets are sold at Philadelphia and Baltimore for Pittsburg and Wheeling, and at Philadelphia and New York for Charleston, S. C., at the following

RATES OF FARE.				
To Pittsburg.	Wheeling.	Charleston.	Win.	Sum.
From Philadelphia, \$13	\$12	\$14	\$13	\$20
" Baltimore,	11	10	12	11
" New York,				20

Passengers leaving New York not later than the afternoon line via Newark, etc., reach Baltimore in season to take the next morning's lines to the South and West.

Passengers leaving Cumberland in the morning and Washington in the evening lines, reach Baltimore in season to proceed to Philadelphia by the evening train at 8 p.m.—so as to reach New York before noon the next day.

An Emigrant line by burthen cars, leaves Baltimore every morning, except Sundays, at 4 o'clock—connecting with a line of the previous day from N. York—and at Cumberland with a wagon line to Pittsburg or Brownsville and Wheeling. Fare by this line:

From New York to Pittsburg,	\$8 00
" Philadelphia	6 50
" Baltimore	5 00

By order, J. T. ENGLAND, Agent.

SOUTH CAROLINA RAILROAD.—A Passenger Train runs daily from Charleston, on the

arrival of the boats from Wilmington, N. C., in connection with trains on

the Georgia, and Western and Atlantic Railroads—and by stage lines and steamers connects with the Montgomery and West Point, and the Tusculum Railroad in N. Alabama.

Fare through from Charleston to Montgomery daily

Fare through from Charleston to Huntsville, Decatur and Tusculum	22 00
--	-------

The South Carolina Railroad Co. engage to receive merchandise consigned to their order, and to forward the same to any point on their road; and to the different stations on the Georgia and Western and Atlantic Railroad; and to Montgomery, Ala., by the West Point and Montgomery Railroad.

JOHN KING, Jr., Agent.



# LAKE SUPERIOR LINE. Cleveland and Detroit,

TO  
SAULT STE. MARIE, CARP RIVER, COPPER  
HARBOR, EAGLE RIVER, ISLE ROYAL,  
ONTONAGON AND LA POINT.

The Proprietors of this line having added largely to their facilities for transportation on this route, will be prepared to ship Goods to any part of Lake Superior during the coming season, and contract for the delivery of Copper Ore to either Boston, New York, or Pittsburg, being connected with the Troy and Western Line, from Detroit to New York, and a Daily line of Canal Boats.

## FROM CLEVELAND TO PITTSBURG.

### Lakes Huron and Erie.

For this portion of the route, the Proprietors are fitting up a large Boat, with a powerful low pressure engine, and a spacious upper cabin, with state rooms, to take the place of the Franklin, which will leave CLEVELAND every Monday Evening at 7 o'clock, and DETROIT every Tuesday Afternoon at 2 o'clock, going to MACKINAW and the BRUCE MINES, and arriving at SAULT STE. MARIE on Thursday morning. The Franklin will leave Detroit every Friday for Mackinaw and Sault Ste. Marie, via the Bruce Mines. For the transportation of heavy masses of Copper, a Propeller will make trips as occasion may require.

### Lake Superior.

Mr. McKnight, one of the Proprietors, is constructing a Wharf to the Channel Bank, at the head of the Portage, which will enable them to load their Propellers, NAPOLEON AND INDEPENDENCE, with but 24 hours' detention at Sault Ste. Marie. One of the Propellers will leave every Friday, making a trip through the Lake, touching at Carp River, Ontonagon and Isle Royal.

The great expense incurred in building wharves to facilitate business, it is hoped, will entitle the Proprietors of this Line to Patronage. Goods shipped by either G. WILLIAMS & CO., or S. P. BRADY, Agents, Detroit, will be receipted through to their destination on Lake Superior. Letters addressed to S. McKnight, Detroit, or Sault Ste. Marie, will receive attention. Supplies will be purchased and delivered at any point on Lake Superior, on the best possible terms, and all orders filled with articles of as good quality as the market affords.

### Canada Line.

To facilitate the forwarding of Goods for the Canada Companies, a connection has been made with PARK & CO., managing owners of the Propeller Earl Cathart, forming a direct line from Montreal to the Bruce Mines and Sault Ste. Marie. Goods sent by this line, care of PARK & CO., Amherstburg, or CHAS. HUNT, Esq., Windsor, will be immediately forwarded, and at prices decidedly to the advantage of parties in Toronto or other Canadian Ports.

S. McKnight,  
J. R. LIVINGSTON,  
P. B. BARBEAU.

January, 1850.

#### AGENTS.

G. Williams & Co., } Detroit.  
S. P. Brady,  
P. L. Sternberg & Co., } Buffalo.  
Charles Hunt, Windsor.  
Park & Co., Amherstburg.  
W. A. Otis & Co., } Cleveland.  
Crawford and Chamberlain,  
Rice, Clapp & Co., New York.  
W. M. Gorrie, Toronto.

**MACHINE WORKS OF ROGERS KETCHUM & GROSVENOR, Patterson, N. J.** The undersigned receive orders for the following articles manufactured by them of the most superior description in every particular. Their works being extensive, and the number of hands employed being large, they are enabled to execute both large and small orders with promptness and dispatch.

**Railroad Work.**—Locomotive Steam Engines and Tenders; Driving and other Locomotive Wheels, Axles Springs and Flange Tires; Car Wheels of Cast Iron a variety of patterns and chills; Car Wheels of Cast Iron with wrought tires; Axles of best American refined iron; springs; boxes and bolts for cars.

**Cotton, Wool and Flax Machinery** of all descriptions and of the most improved patterns, style and workmanship.

**Mill gearing and millwright work** generally, hydraulic and other presses; press screws; callenders; lathes and tools of all kinds; iron and brass castings of all descriptions.

ROGERS, KETCHUM & GROSVENOR,  
Patterson, N. J. or 74 Broadway, New York.

# CENTRAL RAILROAD FROM SAVANNAH TO MACON, (Ga.) 190 1/2 miles.

Passenger Trains leave Savannah and Macon daily at 7 a.m.  
Passenger trains arrive daily at Savannah, 6 15 p.m.  
" " " Macon, 6 45 p.m.

This road, in connection with the Macon and Western road from Macon to Atlanta, and the Western and Atlantic road from Atlanta to Dalton, now forms a continuous line of 391 1/2 miles in length\* from Savannah to Dalton, Murray county, Ga. and with the Memphis Branch railroad, and Stages connect with the following places:

Tickets from Savannah to Macon,	\$5 75
" " " Atlanta,	9 50
" " " Augusta,	6 50
" " " Columbus,	15 00
" " " Opelika,	17 00
" " " Jacksonville, Ala.,	20 00
" " " Talladega,	"
" " " Huntsville Ala.,	22 00
" " " Decatur,	"
" " " Tusculumbia, Ala.,	22 50
" " " Tuscaloosa, Ala.,	"
" " " Columbus, Miss.,	28 00
" " " Aberdeen,	"
" " " Holly Springs,	"
" " " Nashville, Tenn.,	25 00
" " " Murphreesboro',	"
" " " Columbia, do.,	"
" " " Memphis, do.,	30 00

An extra Passenger Train leaves Savannah on Saturdays, after the arrival of the Steam-ships from New York, for Macon, and connects with the Macon and Western railroad; and on Tuesdays, after the arrival of the Macon and Western cars, an extra Passenger Train leaves Macon to connect with the Steam ships for New York.

Stages for Tallahassee and intermediate places connect with the road at Macon, Mondays, Wednesdays, and Fridays, and with Milledgeville at Gordon daily.

Passengers for Montgomery, Mobile and New Orleans take stage for Opelika from Barnesville through Columbus, a distance of 97 miles, or from Griffin through West Point, a distance of 93 miles.

\* The Western and Atlantic railroad will soon be completed between Dalton and Chattanooga, a distance of 423 1/2 miles from Savannah, of which due notice will be given.

† Head of the West Point and Montgomery railroad, on which the fare to Montgomery is about \$2.

#### RATES OF FREIGHT FOR MERCHANDISE GENERALLY, FROM SAVANNAH TO MACON.

Measurement Goods.—Boxes of hats, bonnets, furniture, shoes, saddlery, dry-goods, and other measurement goods, per cubic foot	13 cents.
Crockery Ware, in crates, boxes or hhds, per cubic foot.	10 "
Goods by Weight, 1st class.—Boxes of glass, paints, drugs & confectionary, per 100 lbs.,	50 "
2d class—Sugar, coffee, rope, butter, cheese, lard, tobacco, leather, hides, copper, sheet and hoop iron, tin, hard and hollow ware, rice, boxes soap and candles, bagging, and other heavy articles not enumerated below, per 100 lbs.,	45 "
3d class—Flour, bacon, liquors, pork, beef, fish, tallow and beeswax, per 100 lbs.,	40 "
4th class—Mill-gearing, pig and bar iron, grind and millstones, nails, spikes and coal, 100 lb. 30 "	
Barrels of beets, bread, crackers, potatoes, ice, fruit, oysters, onions, and all light bbls, each, 75 "	
Oil and molasses per hhd., (smaller casks in proportion)	\$6 00 "
Salt per sack not exceeding 4 bushels,	50 "

Goods consigned to Thos. S. Wayne, Forwarding Agent, Savannah, will be forwarded free of commission.  
WM. M. WADLEY, Supt.  
Savannah, Ga., February 24, 1850.

#### ENGINEERS' AND SURVEYERS'

#### INSTRUMENTS MADE BY

EDMUND DRAPER,

Surviving partner of  
STANCLIFFE & DRAPER.



No 23 Pear street,  
near Third, Philadelphia.

# GREAT NORTHERN & SOUTHERN MAIL ROUTE. From New York to Charleston, S. C.

daily, via Philadelphia, Baltimore, Washington City, Richmond, Petersburg, Weldon and Wilmington, N. C.

Travellers by this route, leaving New York at 4 1/2 p. m., Philadelphia at 10 p. m., and Baltimore at 6 a. m., proceed without delay at any point on the route, arriving at Richmond, Va., in a day, and at Charleston, S. C., in two and half days from New York.

Through tickets from New York to Charleston, \$20 00  
" " " Baltimore to Richmond, 7 00  
" " " Petersburg, 7 50

For tickets to Richmond and Petersburg, or further information, apply at the Southern Ticket Office, adjoining the Washington Railroad Ticket Office, Pratt Street, Baltimore STOCKTON & FALLS.  
October, 1849.

# ST. LAWRENCE & ATLANTIC RAILROAD COMPANY.

Notice is hereby given that the  
Trains run twice per day between

Montreal and St. Hyacinth, leaving each terminus alternately, until further notice.

Leaving St. Hyacinth at	7 am.
" " " "	3 pm.
Leaving Montreal at	10 am.
" " " "	6 pm.

THOMAS STEERS, Secretary.

May 31, 1849.

# WESTERN AND ATLANTIC RAILROAD, FROM ATLANTA, GA., TO CHATTANOOGA, TENN.

140 Miles.

## PASSENGER SCHEDULE.

Leave Chattanooga daily, Sundays excepted, at 8 1/2 a. m.	
Arrive at Kingston	by 12 m.
" Dalton	by 3 p. m.
" Chattanooga	by 6 "
Leave Chattanooga daily, Sundays excepted, at 7 a. m.	
Arrive at Dalton	by 9 1/2 "
" Kingston	by 12 m.
" Atlanta	by 4 p. m.

The fare is now permanently reduced to three cents per mile for way as well as through Passengers; children and servants two cents per mile.

There are two Railroad routes from Atlanta to the Seaboard, viz: one by the Georgia Railroad to Augusta, and thence to Charleston by the South Carolina Railroad; the other by the Macon and Western Railroad to Macon, and thence to Savannah by the Central Railroad.

At Kingston, 60 miles north of Atlanta, the Rome Railroad branches off to Rome on the Coosa river, which admits of steamboat navigation as far down as Greensport in Ala. Mail stages are in operation from Rome leading towards Tuscaloosa, Ala., Columbus, Miss., Memphis, Tenn., etc.

At Dalton, 100 miles north of Atlanta, a line of stages branches off to Knoxville, Tenn., which will be superseded by the East Tennessee and Georgia Railroad as rapidly as the same is completed.

At Chattanooga a number of steamboats are in successful operation on the Tennessee river, and from that terminus of the road stages run to Nashville, which will be superseded by the Nashville and Chattanooga Railroad as rapidly as the same is completed.

WM. D. FULLTON, Supt. Transp.

Transportation W. & A. R. R.,

Atlanta, March, 1850.

# CAR MANUFACTORY CINCINNATI, OHIO.



**KECK & DAVENPORT** would respectfully call the attention of Railroad Companies in the West and South to their establishment at Cincinnati. Their facilities for manufacturing are extensive, and the means of transportation to different points speedy and economical. They are prepared to execute to order, on short notice, Eight-Wheeled Passenger Cars of the most superior description. Open and Covered Freight Cars, Four or Eight-Wheel Crank and Lever Hand Cars, Trucks, Wheels and Axles, and Railroad Work generally.  
Cincinnati, Ohio, Oct. 2, 1848.

# FOWLER M. RAY'S METALLIC INDIA RUBBER CAR SPRINGS.

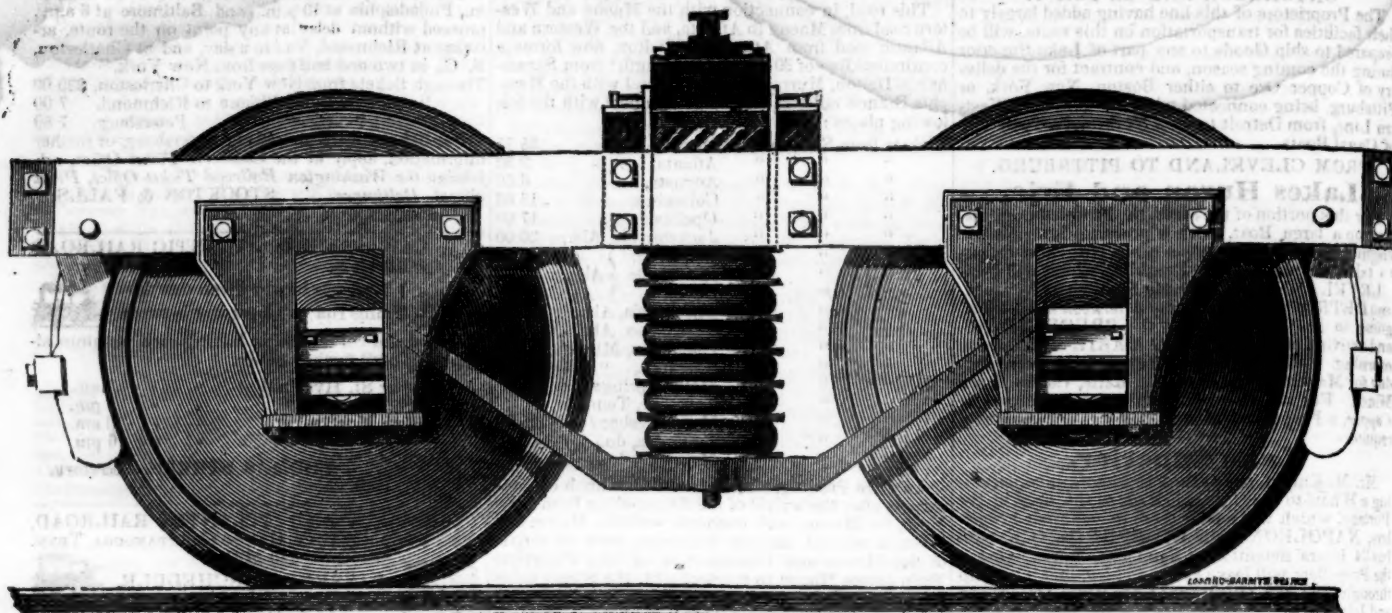


Fig. 1.

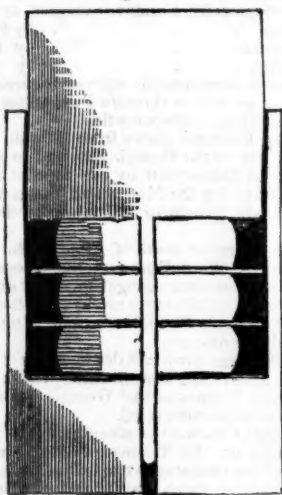


Fig. 2.

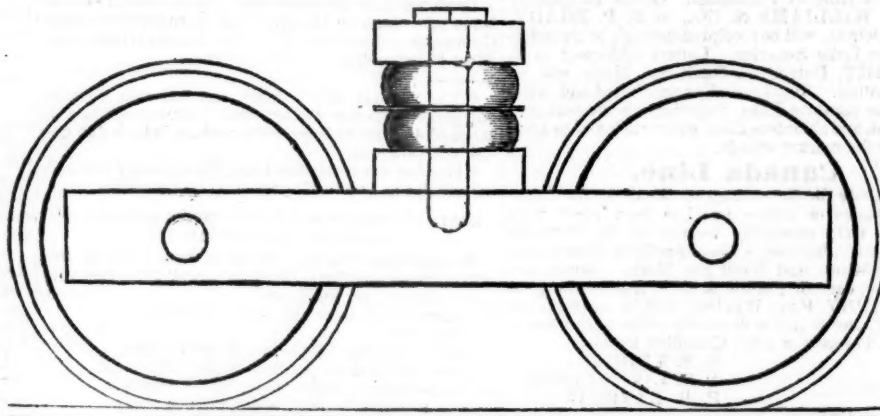


Fig. 3.

So much has been published for the purpose of misleading the public in regard to the inventorship of the India-rubber Railroad Spring, patented in the United States by Mr. W. C. Fuller, that the New England Car Company, proprietors of this invention, have deemed it proper, for the information of Railroad Companies, Car Builders and the public generally, to lay before them the facts upon which they found their claim to this invention, and to a Patent therefor.

Cut No. 1, Represents a cross section of the first model made by Mr. Tucker, under the direction of Mr. Ray, in the summer of 1844, and to which Mr. Tucker, Mr. Bradley and Mr. Bannester testify as being the model marked "B."

Cut No. 2, Represents the model made in 1845, to which Mr. Osgood Bradley and Gen. Thos. W. Harvey have testified.

Cut No. 3, Represents a rough sketch made by Mr. Ray in 1844, which he gave to a man about departing for England to take out some patents, who promised to write to Ray after his arrival in that country—which promise he has probably forgotten.

Mr. W. C. Fuller, of England, patented the above Spring in that country on the 23d October, 1845. He filed his enrollment April 23d, 1846, and on the 22d October, 1846, he took out a patent in the United States under the title, "For Improvement in Railway Carriages," when the improvement consisted in the spring, and not in the carriage.

The reader will perceive by the annexed testimony, that the India-rubber Railroad Car Spring was invented by Mr. Ray about two years previous to the date of Mr. Fuller's enrollment.

The Depositions are omitted for want of room, but will be published in full in the course of a few weeks.

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HENRY V. POOR,  
136 NASSAU STREET.